Survey of the

PREVALENCE OF COMMON PLANT DISEASES

in the

DOMINION OF CANADA

1920

First Annual Report

Division of Botany
Experimental Farms Branch
Department of Agriculture.

Following the action taken at the first annual meeting of the Canadian Phytopathological Society, expressing the desirability of accummulating data on the annual prevalence of the commoner plant diseases, an attempt was made during the summer of 1920 to institute such a survey. The success of the project depended entirely upon the number of observers who would contribute. The plan devised and carried out this year consisted of two principles, first to ask only those professionally engaged in botanical or pathological work to assist and second to have these observers submit individual field records. The invitation to collaborate in the survey was therefore sent to all those who it was thought would be interested and they were supplied with forms for making reports. The present summary is based upon the field data as obtained from these reports. It is regretable that very few reports were received from some districts and in many cases the number of observations made on some crops are too few

to legitimately take these as average conditions. Fortunately summaries were prepared by collaborators for Manitoba, Saskatchewa Alberta and British Columbia which give briefly the conditions in those provinces. In eastern Canada outside the Niagara Fruit Belt (Lincoln and Wentworth Counties, Ontario) the information at hand for this report for the most part consisted of a few scattered field reports from which it is unsafe to draw conclusions. However, the number of reports received from these districts and the average are given as a matter of record. Profiting by the experiences of the first year it is hoped that a better report will be forthcoming for 1921.

W.H. Rankin.

W.P. Fraser.

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C O N T E N T S

DISEASES OF CEREAL CROPS

-DISEASES OF BARLEY-

Stem rust caused by Puccinia graminis

Very few reports on barley diseases were received from the eastern provinces. The figures on stem rust follow:

Que. One report, 25%

Ont.(E) One report, 5%

Ont.(N) Six reports, average of 18.7%

Man. Four reports, 2 slight, 1 medium, 1 severe. "Black stem rust occurred commonly on barley; but most of the crop matured before serious damage was caused by the rust." Bisby. "Black stem rust caused little damage to barley; but it developed very abundantly on the host."- Connors.

Sask.& Alta. "Stem Rust, Puccinia graminis, was common on barley wherever rust was prevalent, but did little or no damage." Fraser and Bailey.

Leaf rust caused by Puccinia simplex

This rust was recorded in a few cases (determination of the fungus was not checked).

Que. One report, 40% of leaf surface affected.

Ont.(E) One report, 10% of leaf surface affected.

Ont.(N) Six reports, averaging 18.7%.

Man. Four reports, 2 very slight, 1 moderate, 1 severe.

Loose smut caused by Ustilago nuda

This smut was common in all provinces from which reports on barley diseases were received. While the losses were not large, the few figures obtained show that this smut is important.

P.E.I. One report, 18%.

Que. Ten reports, average of 5.2%.

Ont. (E)Two reports, average of 4.8%.

Ont. (N)Five reports,average of 1.8%.

Man. Four reports, 1 slight, 1 moderate, 2 severe.

"This barley smut was quite common. The same considerations as mentioned for loose smut of wheat apply here also." - Bisby.

"Loose smut was a very common smut on barley, up to 5% was observed to occur." - Connors.

Sask. & Alta. "This smut was common on barley, but generally the percentage was small, averaging not more than 1% to 5%." - Fraser and Bailey.

Covered smut caused by Ustilago hordei

Only a few detailed reports on this smut were received.

Que. Two reports, average of 15%.

Ont. (N)One report, 1%.

Man. One report, slight.

"Little of this smut was found." - Bisby.

"Observed only twice." - Connors.

Sask. & Alta. "Covered smut was not so common as the loose smut but occurred in many places." - Fraser and Bailey. Five reports from Alberta gave an average of 3.8%.

Stripe, spot blotch and net blotch, caused by *Helminthosporium gramineum*, *H. sativum* and *H. teres*.

Only a few detailed reports were received from the eastern provinces:

Que. Three reports, averaging 2%.

Ont. (E) One report, 40%.

Ont. (N) One report, 50% (total loss of several acres).

Man. "Stripe disease was quite serious the past year, being probably the worst barley disease. The other Helminthosporium diseases, spot blotch and net blotch were not found to be serious the past year." - Bisby.

"Stripe disease or leaf blight was very serious at Winnipeg. It was in evidence elsewhere; but the damage done was difficult to determine." - Connors.

Sask. & Alta. "Stripe disease was not rare, in some places quite severe."

"Spot blotch was quite severe in some places, but was not serious generally. It was not nearly as common or severe as in 1919."

"Net blotch was present in many fields, but did not seem to cause much injury except in some small experimental lots, where the seed had been imported". -Fraser and Bailey.

Minor diseases of Barley

"Bacterial blight (Ps. avenae) and Helminthosporium were common north of Sudbury, Ontario. Considerable loss in some fields where infection ran from 5. to 25%." - Faull.

"Bacterium translucens was collected at Winnipeg; but search at other points of the province did not reveal any of the disease".-Connors.

-DISEASES OF CORN-

Smut caused by Ustilago zeae

Smut was reported from all the provinces in about the usual percentages expected. The figures for Quebec and eastern Ontario are, however, very high and constitute a considerable loss if they truly represent average conditions.

N.B.	Two reports, average 2%.
Que.	Four reports, average of 4.3%.
Ont. (E)	Four reports, average of 8.5%.
Ont. (S)	Two reports, average of 1.0%.
Ont. (N)	One report, "high percentage."
Man.	"Smut was widely distributed, but caused probably less than one-half per cent loss."-Bisby.

Rust (Puccinia sorghi) and root-rots (Fusarium) were reported by Dr. Bisby as not found this year in Manitoba.

-DISEASES OF OATS-

Stem rust caused by Puccinia graminis

This rust was common in the eastern provinces but not serious if the reports received represent general conditions:

N.B. Two reports, average of 5%.

Que. Eleven reports, average of 9%.

Ont.(S)One report, 5%.

Ont.(N)Ten reports, average of 3%.

Man. Five reports, all slight,

"Occurred in small amounts but was not serious."- Bisby and Connors.

Sask. & Alta. "It was present in a few places, but it was not at all common. No collections were made in Alberta." - Fraser and Bailey.

Leaf rust caused by Puccinia coronata

This rust was reported as follows:

N.B. Four reports, average of 33% of leaf surface affected.

Que. Twenty-two reports, average of 16% of leaf surface affected.

Ont.(E)One report, 50% of leaf surface affected,

Ont.(S)Three reports, slight amoumt,

Ont. (N) Ten reports, average of 27% of leaf surface affected.

Man. Three reports, slight amount.

"Fairlycommon but caused little loss". - Bisby.

Sask. & Alta. "Rare in Saskatchewan. No collections made in Alberta." - Fraser and Bailey.

Smuts caused by Ustilago avenae and U. laevis

From the reports received, loose smut of oats was common in the eastern provinces and caused considerable loss, ranging from 3% to 7%. Covered smut was reported as especially destructive in Quebec where an average of ten reports showed 17%. These specimens were not seen for identification. The following figures for oat smut were received:

P.E.I. Two reports, average 5%.

N.B. Four reports, average 12%.

Que. Thirty-three reports, average 6%.

Ont.(E) Eleven reports, average 5%.

Ont.(S) Five reports, average 5%.

Ont.(N) Fourteen reports, average 3.5%.

Man. "Oat smut caused some losses, perhaps 1% for the province. Many growers treat their seed to avoid smut". - Bisby.

Sask. & Alta. "These smuts caused some loss, usually only a small percentage." - Fraser and Bailey.

Minor diseases of oats.

Spikelet sterility.

"Occurred in about the usual amount." - Bisby.

Leaf spots.

"Bacterial leaf spots are common in some districts of Saskatchewan and Alberta." - Fraser and Bailey.

-DISEASES OF RYE-

Stem rust caused by Puccinia graminis

Ont.(N) Found in one case causing 80% infection.

Man. "Stem rust was not abundant on rye, and caused little or no damage." - Bisby.

"Stem rust was not abundant on rye". - Connors.

Sask. & Alta. "Stem rust was not common on rye and did no damage." - Fraser and Bailey.

Leaf rust caused by Puccinia dispersa

Ont. (S) Two reports of heavy infection.

Ont. (N) One report of 80% infection.

Man. "Leaf rust was found quite commonly; but was not serious." - Bisby.

"Leaf rust was found frequently; but was not serious." - Connors.

Sask.& Alta. "Leaf rust was rare on rye, except in the Edmonton district where it was quite severe though apparently not doing serious injury."- Fraser and Bailey.

Smut caused by Urocystis occulta, was not reported from any provinces. It is known to occur in Manitoba, but is apparently rare and was not collected this year.

Ergot caused by Claviceps purpurea

Ont. (E) One report, very slight.

Ont. (N) Two reports, average of 9%.

Man. "Ergot occurred commonly on rye; but the loss is estimated at less than onepercent." - Bisby.

"Ergot, (Claviceps purpurea) was found occasionally." - Connors.

Sask. & Alta. "Ergot was general, but usually not severe, not being more than 1% to 3%." - Fraser and Bailey.

A report from Alberta stated that ergot was severe around Edmonton.

Powdery mildew caused by Erysiphe graminis

Man. "Powdery mildew was found in considerable abundance on the lower leaves of rye at Winnipeg in July; but caused very little damage." - Bisby.

Sask. & Alta. "Powdery mildew was abundant at Edmonton on rye." - Fraser and Bailey.

-DISEASES OF WHEAT-

Stem rust caused by *Puccinia graminis*

This disease was not destructive according to the reports received, except in parts of Prince Edward Island and in Northern Ontario. Wheat was rusted badly in Quebec but the effect on yield was not indicated. A summary of conditions follows:

P.E.I. Four reports, average of 47%.

"Stem rust was very severe in Prince County, the crop being practically destroyed in many cases. In Queens County there was considerable rust but in Kings County the infection was light". - Hetherington.

N.B. Two reports, showing 1% infection.

Que. Five reports, average infection, 47%.

Ont.(E) Two reports, 4% and 12%.

Ont.(S) One report, 12%.

Ont.(N) Three reports 83%

"In the Rainy River District wheat was very badly rusted; crop almost entire failure. Oats however, were fairly free from stem rust. No rain during the growing season. In the Thunder Bay District wheat of all varieties severely rusted." - Hurst.

Man. Fifteen field estimates received; 2 very slight, 4 slight, 7 moderate and 2 severe, all near winnipeg.

first part of August and became abundant on almost every variety, causing considerable damage to late planted wheat. It was first abundant on the leaves and sheaths and later attacked the stems, necks and heads." - Bisby.

"Rust did not develop as rapidly in the Western part of the province as it did in the Red River Valley. Only traces could be found up until July 19. Rainy weather the next week led to abundant development of rust. Considerable damage was caused in local areas on late wheat." - Connors.

Sask. "Late grain was heavily rusted over Saskatchewan but there was little damage. Early grain showed little rust. The distribution of the rust was much the same as in 1919, but stem rust was more severe in that year and did much damage in northern Saskatchewan to late grain." - Fraser and Bailey.

"In Almeda district rust was very severe; reduction in yield about 30%. - Hockey.

Alta. "In northern Alberta there was very little rust on the main crop, but on late grain a few pustules could be collected. In southern Alberta there was practically no stem rust. On very late grain a few pustules could be collected but none could be found on the main crop.

No cereal rusts were found in the Peace River district.". - Fraser and Bailey.

Summary of dates of appearance
(Bisby, Connors, Fraser and Bailey)

Province	Aecia open	Uredinia found
Man.	June 11 July 2,6,9,13, Aug. 4,9, 13,19,24 and 30, Sept. 16	June 30 - Winnipeg July 5 - Morris. July 7 - Brandon. July 10 - Virden. July 17 - Rapid City.
Sask.		July 9 - Weyburn. July 14 - Indian Head July 15 - Yorkton. July (last) - Saskatoon Aug. (first) - Scott.
Alta.		Aug. 12 - Edmonton.

Leaf rust caused by Puccinia triticina.

This rust was much more common in eastern Canada than in the west. Reports received show the following average percentage leaf surface affected:

P.E.I. Six reports, 34%.

N.B. Three reports, 10%.

Que. Six reports, 38%.

Ont.(E) One report, 65%.

Ont.(N) Three reports, 83%.

Man. Fifteen reports, 2 very slight, 8 slight, 3 moderate and 2 severe.

Sask. One report, trace.

Alta. Four reports, very slight.

The following summary statements show that leaf rust was of little importance in the west.

Man. "Was fairly common, but it caused little or no loss in the yield". - Bisby.

"Probably did little damage." - Connors.

Sask. "Not common, found here and there".-Fraser and Bailey.

Alta. "Rare in Alberta." - Fraser and Bailey.

Loose smut caused by Ustilago tritici

The reports received from the Eastern Provinces on this disease are not abundant enough for drawing conclusions. The figures follow:

P.E.I. Three reports, average 6%.

N.B. Three reports, average 8%.

Que. Seven reports, average 3.3%.

Ont.(E) One report, 1%.

Ont.(N) One report, 3%.

Man. Ten reports, 3 very slight and 7 slight.

"This smut occurred commonly in wheat, from a trace to about 1% or occasionally more. In certain cases, it may become necessary to make arrangements for treating for this smut by the hot water method, or for the discarding of seed lots more seriously affected." - Bisby.

"This smut was to be found quite frequently. Counts made gave from a trace to 2%." - Connors.

Sask.& Alta. "This smut was found commonly on wheat. One large field showed 5% infection. Generally fields were almost free or showed ½% to 1% of this smut." - Fraser and Bailey.

Bunt or Covered smut caused by Tilletia tricici and T.foetens

No reports were received from the eastern provinces on this disease. The following are the summaries for the west.

Man. "Little ount was found, and this was the low form Tilletia tritici. The high form Tilletia laevis was not collected. Most growers insure their wheat against this disease by formaldehyde. treatment." - Bisby.

"Bunt on covered smut was not collected. Formaldehyde treatment of seed wheat by the farmer keeps this disease almost entirely in check." - Connors.

Sask.& Alta. "This smut was not common except locally.

All of the collections were Tilletia tritici, except in some check plots for smut control at Indian Head where the smut was Tilletia laevis."- Fraser and Bailey.

Scab caused by Gibberella saubinetii

Ont.(E) "Was present to extent of 1% on Central Experimental Farm." - Drayton.

Man. "The summer was not sufficiently moist for the development of scab on wheat. A few specimens were sent in on August 20th from Minnesota, and a few were found in Khapli wheat at Winnipeg."-Bisby.

"Scab was found on a few heads of Khapli wheat at M.A.C., Winnipeg. The dry season held this disease wholly in check." - Connors.

Sask. & Alta. "Scab of wheat was not collected in Saskatchewan or Alberta, and very little was found in Manitoba. In 1919, Scab was prevalent in Manitoba, doing a considerable local damage. A few collections were made in Saskatchewan, but no serious injury was done". - Fraser and Bailey.

Minor diseases of wheat.

Glume spot caused by Septoria:

Two reports from Prince Edward Island, 2% and 15%.

Reported from New Brunswick and Ottawa.

Not seen in Manitoba.

Not seen in Saskatchewan and Alberta. It was not rare there in 1919.

Root rots caused by various fungi:

Caused some injury, especially to seedlings in Manitoba, but not serious.

Were common in some districts in Saskatchewan, and seemed to be due to a species of Helminthosporium.

Basal glume rot caused by Bacterium atrofaciens

Not seen in Manitoba.

Collection made at Scott, Saskatchewan, It was severe in a few small plots. Also found at Morse.

Ergot caused by Claviceps purpurea

Not seen in Manitoba.

Not found in Saskatchewan this year, several collections made in 1919.

Powdery mildew, caused by Erysiphe graminis:

Not found in Manitoba, Saskatchewan or Alberta.

Black chaff caused by Bacterium sp.

Not found in Manitoba, Saskatchewan or Alberta.

Helminthosporium spotting:

Slight amount in Manitoba and Alberta.

Stripe rust caused by Puccinia glumarum.

"This rust was collected at Stettler, Alta, on Hordeum jubatum by Miss Newton. Attempts were made in the greenhouse to infect wheat but without results. This rust was collected in abundance on Hordeum jubatum at Edmonton, Alta., in 1919, but also failed to infect wheat.". - Fraser and Bailey.

DISEASES OF FORAGE CROPS

-DISEASES OF ALFALFA-

Leaf spot caused by Pseudopeziza medicaginis

A few reports were received as follows:

Ont. (E) One report, "heavy infection," - one, 10%.

Ont. (N) One report, "high percentage."

Man. "Leaf spot was quite common, but no great amount of damage was caused." - Bisby.

White spot (physiological?)

Man. "White spot (physiological? See Phytopath 6:91) was found not uncommon at Winnipeg in the early part of the season. It did not appear to be serious, for the affected plants produced a good crop." - Bisby.

-DISEASES OF AWNLESS BROME GRASS-

Sask. & Alta. "A leaf spot of Awnless Brome was quite severe in some districts in Saskatchewan. This disease has been prevalent in Western Canada for several years." - Fraser and Bailey.

-DISEASES OF CLOVER-

Rust caused by Uromyces trifolii

Man. "Rust occurred commonly on white clover, killing many of the leaves. Aecia were abundant in late

June and early July, and were followed by uredinia and telia." - Bisby and Connors.

Leaf spots

Man. "Clover leaf spots were not found in serious quantity." - Bisby.

-DISEASES OF FLAX-

Rust caused by Melampsora lini

Man. "Rusted flax was sent in in July from Headingly; and about the same time and later was found on the plots at Winnipeg. The rust seen was not severe enough to affect seed production particularly, but the lesions on the stems were sufficiently abundant to lessen the value of the flax for fibre purposes." - Bisby.

Sask. & Alta. "Rust was collected in several places and seemed to be generally distributed though in no place severe. A collection was made in the Peace River district." - Fraser and Bailey.

Wilt caused by Fusarium lini

Man. "Wilt was not found." - Bisby.

Sask. "Wilt was severe in some fields in Saskatchewan and caused local losses." - Fraser and Bailey

-DISEASES OF HOG MILLET-

Man. "A smut (Sorosporium syntherismae, determined by Prof. W.P. Fraser) was sent in on Sept. 1st from Keyes, Man. on "hog millet," (Panicum milaceum)," - Bisby.

-DISEASES OF MEADOW FESCUE-

Ont. "In plots of this grass grown at the Central Experimental Farm, Ottawa, from seed imported from Sweden, 90% of the plants were attacked by Helmintnosporium," - Drayton.

-DISEASES OF SUNFLOWER-

Rust caused by Puccinia helianthi

This rust was reported on only from the western provinces.

Man. "Rust was quite serious on sunflowers through the province. Aecia (not necessarily all P. helianthi) were collected at Winnipeg from June 28th through July, and Uredinia were found in late July, followed the remainder of the season by telia (and uredinia), until many of the lower leaves were killed." - Bisby.

"Dr. Bisby reports aecial stage on June 28th. Although the aecia were very common on the leaves at Winnipeg, the rust did not develop with the

rapidity that it did at Brandon where the aecial stage was not observed. The seriousnesss of sunflower rust is still an open question." - Connors.

Sask. & Alta. "Rust was quite common on sunflowers in Manitoba and Saskatchewan, and caused shrivelling of the lower leaves. It was not collected this season in Alberta, though previous collections were made". - Fraser and Bailey.

Stem rot caused by Sclerotinia sp.

Man. "A rot of the stem of sunflower plants was found in the latter part of July in the plots at Winnipeg. The stem was usually attacked near the surface of the ground, although the lesion sometimes occurred higher on the stem. The plants died rather soon, and sclerotia were present outside and inside the affected portions of the stems. This disease threatens to be quite important, and work is being done with it. It appears to be quite widely distributed in Manitoba." - Bisby.

"A single plant was found at Brandon. MissNewton also located the disease at Morden. It may be quite widespread, and an important factor in sunflower growing. A few weeds of the Compositae were attacked." - Connors

Ont. "Sunflowers at the Central Experimental Farm, Ottawa were found affected by a Sclerotinia to the extent of 1%." - Drayton.

Powdery mildew caused by Erysiphe cichoracearum

Man. "Powdery mildew occurred on leaves of sunflowers which were allowed to grow until September." -Bisby.

"Burning of the foliage (cause unknown) occurred to some extent at Winnipeg, Man. " - Bisby.

-DISEASES OF TIMOTHY-

Stem rust caused by Puccinia graminis

Ont. "Volunteer timothy on Bear Island, Temagami Forest Reserve (northern Ontario) was found severely rusted, estimated at 50% infection." - Faull.

Alta. A report from Alberta gave 15% infection of timothy stem rust.

-DISEASES OF WESTERN RYE GRASS-

Rust caused by Puccinia Clematidis

Sask. & Alta. "Leaf rust was prevalent in some districts, but did practically no damage." - Fraser and Bailey.

Smut caused by Ustilago Agropyri

Man. "Western Rye Grass smut has not been found locally this year." - Bisby.

Sask. & Alta. "This smut was not commonly observed though collected at Saskatoon and Indian Head." Fraser and Bailey.

DISEASES OF FRUIT CROPS

-APPLE DISEASES-

Scab caused by Venturia inaequalis

Ont. (E) Out of 66 orchards examined in September a "noticeable" amount of scab was found on the fruit in 21 orchards. The average percentage of fruit scabbed was 0.35%. At the Central Experimental Farm 1% scab on the fruit was reported.

Ont. (S) "Only 5 orchards out of 73 examined in August showed a "noticeable" amount of scab. The average percentage of fruit scabbed was 0.07%. The check trees in a demonstration orchard in Norfolk County showed for Baldwin 1.8% scab and for Spy 8.5% scab; Sprayed trees showed from 0.0% scab in four cases up to 10.8% for one greening tree. Seventeen sprayed trees out of 24 showed less than 1% scab. At Collingwood, Ont., sprayed trees showed 0.1% scab on Baldwin, 6.0% on Spy, 6.6% on Greening, 4% on Ben Davis and 6.9% on Snow. In all cases in southern Ontario little or no early infection took place. It was very difficult to find any scab on the leaves of sprayed orchards in August and the small percentage of scab on the fruit was limited, no doubt by the freedom from foliage infection."- Rankin and McCurry.

Man. "A small amount of scab occurred on leaves and fruit

of apples at Winnipeg. Spraying was not practised, and scab was not serious enough to warrant it." - Bisby.

B.C. "Apple scab is widespread on Vancouver Island and Lower Mainland but conditions are better this season than usual in this section. Absent from Dry Belt between North Bend and Salmon Arm including the orchard area at Wallachin, reappears at Salmon Arm and along the Upper Okanagan Valley. At Vernon where irrigation begins it is only serious in McIntosh Reds and similar susceptible varieties or in very wet season. Two sprayings even on McIntosh Reds ordinarily give over 99% clean fruit. From Vernon south the Okanagan and Similkameen district are almost free. Occasionally a little appears at Kelowna on McIntosh on the flats or where air drainage is poor. At Summerland, Naramata, Penticton and Keremeos, I have never seen the slightest indication of it in fruit or foliage. In the Boundary country e.g. Grand Forks it occurs in susceptible varieties. In the Kootenay and Arrow Lake section and in the Creston Valley it is the worst enemy of the apple growers although three sprays, Pink, Calyx, and one later will generally give 95% control even on McIntosh Reds. Late infection is negligible owing to the dryness of July and August and (usually) early September in B.C. generally. This season scab is worse than usual in these last sections although much of the infection is merely "pin head" spots in or around the calyx due to early

season is due to cold, wet, backward weather, protracting the blossoming period. As long as 25 days elapsed in some cases between the application of the "Pink" and the "Calyx" spray. Unsprayed McIntosh Reds will show 95% to 98% scab mostly severe, other varieties 75% to 90%. Variety Ontario appears to be the most resistant. The delayed dormant spray appears to be useful along the Kootenay Lake." - Eastham.

Twig blight caused by Bacillus amylovorus

Ont. (S) "There was a noticeable amount of apple twig blight generally throughout Lincoln County in mid-summer. Counts made in 18 orchards and averaged together with 73 orchards showing only a slight amount or none, showed an average of about 1.5% of the twigs affected." - Rankin and McCurry.

B.C. "Fire blight (B. amylovorus) appears now to be confined to the Okanagan and Grand Forks district with a little at Salmon Arm, no new infections having been reported from the Kootenays. Owing to rigid inspection, better management of irrigation, elimination to a large extent of Transcendent Crabs and Spitzenbergs, the disease has been pretty well under control in apples since 1915." - Eastham.

Apple tree anthracnose or black spot canker caused by Neofabraea malicorticis (Cord.) Jackson

B.C. "This is destructive on Vancouver Island and Lower Mainland. Disappears in the Dry Belt. Reappears at Salmon Arm where it is on the increase. Absent from the Okanagan south of Vernon and from the Boundary country but found slightly at Creston and elsewhere in the Kootenays but has never called for special treatment in that area. Damage difficult to estimate, young trees are often killed outright and sometimes full bearing ones. In a block of 20 year old Baldwins at Keatings, Vancouver Island, over 80% of the one and two year old growth was killed out each year in addition to numerous large cankers on the limbs. The yield of these trees was about 1½ boxes (60 lbs) per tree. After four years of experimental spraying in this block (without other treatment) the yield was averaging 9 boxes (360 lbs) per tree. In the Fraser Valley the disease is even more severe. It is to be feared that with the abnormal seasonal condition this year (over 10 inches of rainfall in September) there will be a heavy infection of the disease before the usual fall spraying could be given." — Eastham.

-CHERRY DISEASES-

Brown rot caused by Sclerotinia cinerea

Ont. (S) "In Lincoln and Wentworth Counties very little brown rot developed in cherries of any variety. The early season

was too dry, for the fungus to thrive. Cherries were abundant and were picked as fast as possible but even then the season was abnormally long and many remained on the tree until dead ripe. Over this three weeks or longer picking season brown rot had ideal conditions for spreading, showers and high humidity occurring almost daily, but for some reason rot was very scarce. The temperature was low throughout the period and this was possibly the limiting factor which prevented an epidemic. The dry early season from the time the buds swelled until ripening time with only one or two rains may have had some effect". - Rankin and McCurry.

B.C. "Brown rot (Sclerotinia) is often severe on stone fruits in the Fraser Valley but has been less serious than usual this year. It does not occur in the interior. Sweet cherries in the Kootenays, a fairly moist section, have so far never suffered from it. This season a severe case of blossom blight of sour cherries near Victoria was found to be due to Sclerotinia." - Eastham.

Leaf spot or yellows caused by Coccomyces hiemalis

Ont. "This disease was rare this season in the Niagara fruit belt. Even in August when a count was made it was found in small amounts only in 21 out of 151 orchards visited. A general average of 1.7% leaves affected was calculated" - Rankin and McCurry.

-GOOSEBERRY DISEASES-

Leaf spot and anthracnose caused by Mycosphaerella and Pseudopeziza

Ont. (E) Very Little.

Ont. (S) Some slight amount in Lincoln County.

Man. Some leaf spot present.

Mildew caused by Sphaerotheca mors-uvae

Ont. (E) European varieties at the Central Experimental Farm showed about 75% of the leaf surface affected by mildew.

-CURRANT DISEASES-

Rust caused by Cronartium ribicola

Ont. (E) This rust was not found in over 70 plantings examined in Leeds County. The currants at the Central Experimental Farms, Ottawa, were reported with 60% of the leaves affected.

Ont. (S) "The blister rust fungus is common on currants, especially the cultivated black, in the Niagara fruit belt. Rust was found in 15 out of 63 plantings in August affecting an average of 5.0% of the leaves." - Rankin and McCurry.

Leaf spots, caused by Mycosphaerella and Pseudopeziza

Ont. (E) These leaf spots of currants were rare.

Ont. (S) Very little of these leaf spots in Lincoln County.

Man. Slight amount.

-GRAPE DISEASES-

Mildews caused by Plasmopora viticola and Uncinula necator

Ont. (E) A slight amount of mildew was found in two vineyards out of 18 examined in September.

Ont. (S) "Very little of either mildew occurred in Lincoln County. A slight amount was found in 22 vineyards out of 144 examined. The average was about 1% of the leaves affected." - Rankin and McCurry.

-PEACH DISEASES-

Leaf curl - caused by Exoascus deformans

Ont. (S) "This disease was of little importance this year. The early spring was long and cold allowing abundant time for cultivating and spraying. Practically all growers got the spray on in time this year before the buds had swelled appreciably. The period for spraying lasted about three weeks. In unsprayed and neglected orchards it was usual to find about 12 or 14% of the leaves curled. As the season developed slowly there was a remarkably long period in which slight temperature changes could have caused an epiphytotic but the changes were so regular that there did not seem to be any favourable infection weather. The above figures for unsprayed orchards illustrate this point. In sprayed orchards curl was rare. Counts in about 30 orchards gave an average of from 0.14 to 1%." - Rankin and McCurry.

B.C. "Peach leaf curl was quite severe. It is general in the

Province." - Eastham.

Brown rot caused by Sclerotinia cinerea

Ont. (S) "Negligible in importance throughout the Niagara fruit belt. Early season figures in Niagara and Grantham townships (Lincoln County) gave in 16 orchards no apothecia and an average of 1.1% blossom injury. In Louth and Clinton townships (Lincoln County) apothecia were found only in one orchard out of 15 and there was practically no blossom injury. The weather early in the season from the time apothecia usually develop until the fruit was set and growing was so dry that the early development of brown rot was impossible. The crop was heavy, and thinning was neglected because of lack of labour but brown rot did not develop seriously although fruit hung on the trees until over ripe in many cases. A survey conducted the last of August showed brown rot noticeable in only 14 orchards out of 156 orchards visited. The average amount of loss was only 0.15%." - Rankin and McCurry.

Little peach and yellows (cause undetermined).

Ont. (S) In a survey made in August of 154 orchards little peach and yellows were found in 22. The average amount found was 0.2%.

-PEAR DISEASES-

Fire blight caused by Bacillus amylovorus

Ont. (E) At the Central Experimental Farm there was an average of 5% twig blight.

Ont. (S) "Very little twig blight occurred in the Niagara fruit district this year. There was little blossom blight also. In a survey made in August twig blight was found in 34 orchards out of 131 with a general average of twigs killed of 1.0%".- Rankin and McCurry.

B.C. "In pear orchards at Kelowna serious loss has occurred chiefly from undetected root blight, but this source of loss also appears now to be better under control." - Eastham.

Scab caused by Venturia pirini

Ont. (S) "This disease was rare in Lincoln County this year. It was found during August in appreciable quantities in only 3 out of 100 orchards. The average percentage of fruit affected was 0.08%." - Rankin and McCurry.

-PLUM DISEASES-

Brown rot caused by Sclerotinia cinerea

Ont. (E) Estimates in August in six orchards showed an average loss of 0.2%. At the Central Experimental Farm the loss was 3%.

Ont. (S) "In the Niagara district careful records were kept on the development of brown rot. In 14 plum orchards in Niagara and Grantham townships (Lincoln County) no apothecia were found and blossoms injury to the extent

of 2.1% occurred. In Louth and Clinton townships (Lincoln County) apothecia were found in 3 out of 15 plum orchards in the ratio of one apothecial cluster to 2 trees. Blossom injury occurred to the extent of about 0.1%. Little damage was done to plums in general except that the more susceptible varieties rotted badly in certain locations near the lake. On the whole due to the heavy crop and the market situation brown rot caused no monetary loss whatever. Plums were picked as fast and as long as the market demanded. Where the costs were prohibitive in relation to the price offered whole sections of orchards (especially of certain varieties) were not picked at all. In a survey the last of August brown rot was noticeable in 85 orchards out 129 visited and there was an average tree run loss of 2.3%." - Rankin and McCurry.

Man. "A few plums were found rotted by Penicillium; but Sclerotinia was not found." - Bisby.

B.C. (see under cherries).

-RASPBERRY DISEASES-

Leaf curl or yellows (cause undetermined)

Ont. (E) Found in 62 out of 69 patches causing an average loss of 6% of the planting.

Ont. (S) "Found in localities to be very destructive. In a general survey made in early June (after some growers had carried out their yearly pulling of diseased

bushes) the following counts were obtained:

"14 plantings out of 52 showed leaf curl to the average extent of 13% diseased fruiting canes and 5% diseased suckers.

"In the remaining plantings the amount was slight. In another series of counts made in August, leaf curl was found in 35 out of 76 plantings, causing an average loss in the 76 plantings of 4.7% of the canes or 10.1% loss in the 35 plantings where it was present to any extent." - Rankin and McCurry.

Man. "Yellows affected a considerable percentage of the plants."- Bisby.

-STRAWBERRY DISEASES-

Leaf spot caused by Mycosphaerella fragariae

Ont. (E) But little leaf spot was found. It was found generally no patch being free out of 25 examined but the amount even late in the season was only about 5% of the leaf surface affected.

Ont. (S) Very little noticed. Average of about 2% of the leaf surface affected in 23 patches examined late in the season.

Man. Not serious.

B.C. "Leaf Spot. (Mycosphaerella) of strawberry is of slight account in the Strawberry areas of the Vancouver Island and the Lower Mainland sections due partly to the short rotation necessitated by the root weevil and to the

practice of cutting and burning the foliage. In the Wynndell district near Creston when weevil is absent and plantations are allowed to remain 4 to 7 years, the disease is more important. Spraying is employed there."- Eastham.

-Miscellaneous notes on fruit diseases-

Apple black rot (Sphæropsis malorum). "Has never been recorded in British Columbia". - Eastham.

Apple Nectria canker. "Occurs in a few of the back lot orchards in Vancouver City". - Eastham.

Mushroom Root rot (Armillaria Mellea). "One or two cases of this are noticed on various orchard trees each year in British Columbia. Chiefly from the Saanich Peninsula but also from Noton Hill, Salmon Arm and Kootenay Lake The disease appears to be of very slight importance in B.C. compared with reports of injury from the Pacific States." - Eastham.

Apple Powdery Mildew. "This is of little consequence in British Columbia when spraying for apple scab is regularly followed. Around Penticton, however, and at other points in the S. Okanagan when there is no apple scab summer spraying with lime sulphur is not being followed and mildew has become quite serious. So far it has not affected the fruit very badly but produces a

stunting of the growth difficult to estimate."- Eastham.

"Apple leaf spots occurred only slightly in Manitoba." - Bisby.

Apple cankers and winter injury. "Common in Manitoba. The long cold winters appear to be the limiting factor in growing most varieties of apple".- Bisby.

Apple silver leaf. "Occurred on a few trees in Manitoba." - Bisby.

Apple. Penicillium fruit rot. "Occurred to a slight extent at Winnipeg." - Bisby.

Cherry "Exoascus cerasi occurs on sweet cherries at Victoria, Vancouver and Agassiz, B.C., causing both leaf curl and witches brooms." - Eastham.

Currant "Powdery mildew on black currant Sphaerotheca mors-uvae was quite severe on black currants at Saskatoon, Sask but appeared too late to do serious injury." -Fraser

Peach mildew (Sphaerotheca pannosa). "A few years ago this did much damage to the fruit in the Commercial peach orchards of the S. Okanagan, B.C. Since the introduction of compulsory spraying with lime sulphur against the Peach Twig Borer (Anarsia Lineatella) in this district, mildewsseems to have been much reduced." - Eastham.

Plum Pocket caused by Exoascus sp. "Quite common at Winnipeg, and sent in also from Thornhill on July 10th." - Bisby.

Plum Black Knot, (Plowrightia morbosa) . "Occurs to some extent on wild plums throughout Manitoba." - Bisby.

Plum Silver Leaf. "Seriously affected a few trees at Winnipeg." - Bisby.

Raspberry and blackberry orange rust Gymnoconia interstitialis. "This fungus has not been recorded in British Columbia." - Eastham.

Raspberry yellow rust. "Occasioned some alarm last year in the Fraser Valley.(B.C.), but has been of trivial importance this year." - Eastham.

Raspberry and blackberry anthracnose. "This disease is of little importance in the Fraser Valley (B.C.) where these fruits are grown despite the moist climate. It is quite bad on the Snyder Blackberry at Hatzic. Logan berries appear to suffer most.". - Eastham.

Raspberry and blackberry crown gall. "This disease is common on Snyder blackberry and loganberry." - Eastham.

Notes on diseases of ornamentals.

Manitoba,(by Bisby)

"Aster wilt was occasionally present".

"Peonies were affected with Botrytis at Winnipeg and Portage la Prairie."

"Snapdragon rust, Puccinia antirrhini, was observed for the first time this spring at the College, but inquiry indicates that it probably occurred in 1919, or possibly

earlier, in the gardens of certain growers.

"Sweet peas were very healthy in general, although there was considerable powdery mildew, (Microsphaera diffusa), later in the season. Rhizoctonia root rot was sent in from Dauphin."

DISEASES OF VEGETABLE CROPS

ASPARAGUS DISEASES

Rust caused by Puccinia asparagi D.C.

Ont. (N). One case reported as severe.

B.C. "Has not been observed in the Province." - Eastham.

BEAN DISEASES

Anthracnose caused by Colletotrichum lindemuthianum (Sacc.& Magn.) Br. and Car.

N.B. Two fields reported with slight to moderate infection and possible 8% loss.

Ont. (E) Forty-three reports principally from Leeds, Frontenac and Carleton Counties give an average estimate of severity of slight to moderate, with a possible average loss of 3%. One field was reported where the loss would run 95%.

Ont. (S) Reported as absent in majority of fields, with slight to moderate insome and occasionally causing a loss of 20%.

Ont. (N) Three reports give the severity as moderate.

Man. "Not reported as at all important." - Bisby.

Alta. & Sask. "Not important." - Fraser and Bailey.

B.C. "Of little importance except in Lower Fraser Valley!" -Eastham.

Blight caused by Bacterium phaseoli E.F.S.

Que. Reported from 3 fields as causing an average loss of 40%.

Ont. (E) Bean Blight was not reported in Eastern Ontario in over 50 fields examined except in Carleton County wher it was reported general out the degree of severity was not indicated.

Ont. (S) Not mentioned in reports from the several counties.

Alta.& Sask. "Not so common as in 1919. Few specimens seen". - Fraser and Bailey.

Mosaic (cause undetermined).

Que. Reported in one field as causing a loss of 2%.

Ont. (E) Reported from in 20 fields out of over 50 as slight to moderate.

Ont. (S) Reported in 15 out of 31 fields examined in Lincoln county as slight to severe with an average loss of about 13% in six fields. Reports from other counties fail to mention this disease.

Man. Noted in two fields near Winnipeg, slight, from .5 to 2.0% infection. Not important.

Root Rot caused by Fusarium sp.

N.B. Reported as present in one field in New Brunswick, causing a loss of 2%. (Identification not checked).

Man. "Some sunscald and a trace of root-rot." - Bisby.

-CABBAGE DISEASES-

Que. Black rot severe in one field reported with loss of 80%.

Ont. (E) In over 55 fields examined in Leeds and Frontenac counties no disease was found. Black rot was found causing a moderate loss in fields near Ottawa, and club-root was severe in one case.

Ont. (S) In over 27 fields examined, no disease was found.

Ont. (N) Black rot, slight, found in one field.

Man. Out of 11 fields examined near Winnipeg no disease was found.

B.C. "Club root was this year recorded for the first time in a city garden in Victoria." - Eastham.

-CANTALOUPE DISEASES-

Wilt caused by Bacillus tracheiphilus E.F.S.

Ont. (E) Wilt serious in 2 fields causing 25% loss.

Ont. (S) Wilt serious in many fields causing 5 to 25% loss.

-CELERY DISEASES-

Ont. (E) In over 45 fields examined in Leeds and Frontenac counties, early blight was found in a few: in the others no disease of importance was noted.

Ont. (S) In over 10 fields examined a slight amount of early blight was found in one; others were free of the disease.

B.C. "Septoria blight not infrequent, but is of little consequence except in the Armstong district." - Eastham

-CUCUMBER DISEASES-

Ont.(E) In over 30 fields examined, 24 were free from disease. Wilt was reported in 3 fields as severe (25%)and in one as slight.

Mosaic reported on Central Experimental Farm at Ottawa as very slight.

Ont.(S) In Lincoln County no disease was found in 10 fields examined. In other counties wilt was reported not uncommon and ranging from 10 to 75%.

Ont.(N) Mosaic reported as slight in one field.

"Practically a total loss in cucumbers at Temagami Station due to Fusarium" - Faull.

Man. "A Wilting of cucumbers examined was attributed principally to dry weather, although there was a certain invasion of the roots by Fusarium and other organisms." - Bisby.

-LETTUCE DISEASES-

Ont.(E) In 8 fields examined no disease was reported.

Ont.(S) In 7 fields examined in Lincoln County, no disease was reported.

Ont.(N) Downy mildew reported slight in one field.

-ONION DISEASES-

Ont.(E) In over 40 fields examined no disease was found except in 2 fields where downy mildew was causing severe damage, estimated at 50% loss.

estimated at 50% loss.

Ont. (S) In over 12 fields examined, no disease was found in 10, while downy mildew in one had caused 5% loss and smut in another had caused 25% loss.

B.C. "Downy mildew occurred at Chilliwack. Injury seemed severe early in the season but the plants for the most part recovered and gave a very good crop." - Eastham.

-PEA DISEASES-

Ont. (E) Ascochyta leaf blight was severe at the Central Experimental Farm, Ottawa, and one field in Dundas County showed 20% "Leaf blight".

Man. "Garden peas suffered somewhat from root-rot."- Bisby.

Alta. & Sask. "Ascochyta blight was collected in a few places but it was not common. Septoria blight was found also". - Fraser and Bailey.

-PEPPER DISEASES-

Man. "An Alternaria rot of pepper fruits caused considerable loss at Winnipeg," - Bisby.

-POTATO DISEASES-

The information regarding potato diseases at the disposal of the disease survey is inadequate for accurate figures on certain diseases. It is hoped that the percentage figures which follow will not be in all cases interpreted literally. The figures, as given,

represent general averages which were first made up by counties (for this work credit is due Mr. George Partridge of the Division of Botanny, Ottawa) and then combined into averages for the Provinces. The original data for these figures were obtained from field inspection reports of the Potato Seed Certification Survey conducted by the Division of Botany, Ottawa. It must be remembered, however, that although accurate counts were made in this survey in several hundred commercial fields in every province except British Columbia, the accuracy of deriving "percentage prevalence" figures from these reports is limited by the following factors:

1. Usually only one inspection of each field was made and therefore only the amount of any given disease was found which was discernible on that date.

2. The date of visitation varied from June to September according to conditions and section of the country, thus making the blackleg and wilt estimates often much too low.

3. Blackleg, leaf roll, mosaic and wilts were the main diseases the inspector looked for, and it is expected that he paid the most attention to these.

4. The inspector is allowed an indefinite classification under the headings of "weak plants" and "misses" which would if diagnosed increase the percentages of diseases present. This is especially true for Rhizoctonia.

5. The inspector is asked to grade the amount of early blight, late blight, tip burn and rhizoctonia, merely as absent slight, moderate or severe. The use of these terms varies considerably and the records are thus hard to interpret.

6. The figures were in many cases obtained from fields where a higher grade of stock than the average was being grown. For this reason the figures represent conditions more as they exist in the best fields of each province than they do a general average for the province as a whole, and are therefore minimum figures so far as determining average losses is concerned

On the whole, therefore, the averages here given are accurate only for mosaic, leaf roll and curly dwarf. The figures on blackleg, wilts and rhizoctonia are subject to interpretation as representing the general average of the amount found from day to day during July, August and September. The cumulative or total average percentage of blackleg, wilt and rhizoctonia would in each case be a higher figure.

The following list gives the number of acres of potatoes inspected in each province. The percentage prevalence f figures given under each disease are the average percent per acre.

P.E.I.	886	Ont.(N)	472
N.S.	389	Man.	594
N.B.	1414	Sask.	246
Que.	3871	Alta.	182
Ont.(E)	991	B.C.	0
Ont.(S)	1072		

Late Blight caused by Phytophthora infestans (Mont.) de Bary

At the time the field inspection of potatoes was in progress (the date varying according to locality) no late blight was recorded in Manitoba, Saskatchewan or Alberta and practically none in ritish Columbia and Ontario. A small percentage of late blight was found generally distributed throughout Quebec and New Brunswick and Nova Scotia. Late blight was also

observed in Queens County, Prince Edward Island. The average percentage of late blight found in the fields was as follows:

P.E.I.	0.10	Ont.(N)	0.02
N.S.	0.22	Man.	0.0
N.B.	0.08	Sask.	0.0
Que.	0.46	Alta.	0.0
Ont.(E)	0.009	B.C.	"practically none".
Ont.(S)	0.15		

From these figures it will be seen that late blight was unimportant so far as the vines were concerned during July and August.

The following comments were received:

Man. "Late blight did not occur in 1920, and is probably rarely present on account of dry atmospheric conditions." - Bisby.

Sask. & Alta. "Late blight caused by Phytophthora infestans was not collected in 1920, nor has the writer ever observed it in Western Canada." - Fraser and Bailey.

B.C. "This is occasionally very destructive in the Lower Fraser Valley especially in the Chilliwack district. In the past two seasons the disease has been practically absent and the chief result of the Department's demonstration spraying for the disease has been to show the necessity of spraying earlier to guard against early blight. Late blight has not been recorded east of Agassiz and Chilliwack, and does not seem to be of much consequence on Vancouver Island &

The following figures on the importance of late blight during the last five years in the Maritime Provinces were furnished by Mr. Paul A. Murphy.

Province	Period	P.C. of possible crop lost	Amount loss in bushels	Value per bush	Total value of loss in dollars.
P.E.I.	1915-19	43%	3,900,000	.75	2,925,000
N.S.	1915-19	30%	2,800,000	1.00	2,800,000
N.B.	1915-19	25%	2,833,000	1.00	2,833,000

Total loss for Maritime Provinces from Late Blight $8,558,000

The following comments by Prof. Georges Maneux of Quebec Province (see Quebec Soc. Protection of Plants Ann. Report 12:43-46) are of interest regarding late blight and its control in Quebec in 1919.

YEAR	ACREAGE	YIELD	AVER.	YIELD PER ACRE.
1917	226,917	18,158,000		80.02
1918	264,871	38,936,000		147.00
1919	315,590	57,280,000		181.50

"It may be stated without fear of error that this increase corresponds to the ever-generalizing use of protection methods...Already weakened by the injuries of insects it (the potato) neverthe less pays a heavy debt to diseases, late blight particularly.... In 40 counties, 60 fields (spraying demonstrations) were established (1919) .....The plots sprayed with Bordeaux gave an average yield 50% higher than the checks.....The plots sprayed with insecticides only yielded 35% over the check.....

leaving a net profit of $30. per acre over the check plots".

The rotting of the tubers was in many sections a serious factor.

Early Blight caused by Macrosporium solani E. & M.

Early blight was present to a slight extent in all the Provinces. It was not a factor in production in either the eastern or prairie provinces.

P.E.I.	slight	Ont.(N)	very slight
N.S.	slight	Man.	very slight
N.B.	very slight	Sask.	very slight
Que.	slight	Alta	very slight
Ont.(E)	slight	B.C.	(see below)
Ont.(S)	slight		

Man. "Early blight was very rare." - Bisby.

Sask & Alta. "Early blight caused by Macrosporium solani was rather rare though common in 1919". - Fraser and Bailey.

B.C. "Early blight has chiefly been serious on the Lower Fraser, notably around Cloverdale. In 1919 the losses were severe, the foliage being almost completely destroyed in some cases by the middle of August. Early blight, tip burn and drought together caused a total failure of the crop on certain peaty soils which burned up badly, but it would be impossible to allocate the amount of injury due to each factor. The disease has not been so serious this season." - Eastham.

Wilts caused by Fusarium

In the survey conducted for certifying seed potatoes no distinction between various "wilts" is made. The figures here given are for wilts in general; blackleg is however, supposed to be recorded separately. It should be pointed out that the figures given below represent a general average of the amount of "wilt" found during July and August and do not give a true estimate of the cumulative or total general average. As the figures show, the wilts were not an important factor in production, except in British Columbia.

P.E.I.	0.03	Ont (N)	0.002	
N.S.	0.01	Man,	0.31	
N.B.	0.01	Sask.	0.037	
Que.	0.16	Alta.	0.02	
Ont.(E)	0.02	B.C.	10.0?	(see below).
Ont.(S)	0.08			

Ont.(N) "Slight net necrosis or internal brown streak believed to be "physiological" and not true Fusarium - necrosis was found generally prevalent in Northern Ontario to an average of 60% of both the Irish Cobbler and Green Mountain stock offered for certification." - Tucker.

Man. "The summer was conducive to the development of wilt, and considerable occurred later in the season. The organism seems to be well distributed throughout Manitoba soils, but probably will not prove so serious in years when better weather for potatoes occurs". -Bid

Alta. & Sask. "Wilt caused by Fusarium was not generally prevalent." - Fraser and Bailey.

B.C. "Taking the Province as a whole probably the most serious diseases are the Fusarium wilts and rots. It is not uncommon to find 20% to 25% of the growing plants wilting, while the loss from "Jelly ends" or other forms of rot may reach 20% of more in individual shipments. "Jelly end rot is only reported from the irrigated districts of Ashcroft and Lillooet. Much of the trouble is due to the use of ppor seed and absence of rotation, the growers being largely Chinese." - Eastham.

Stem-rot caused by (Rhizoctonia) Corticium vagum solani Burt

This disease was not so common in the east as it was in Northern Ontario and west. It is expected that the figures given in the potato survey reports are muc too low, since many hills counted as misses are due to this disease and many hills are overlooked early in the season.

P.E.I.	slight	Ont.(N)	3.0
N.S.	slight	Man.	0.8
N.B.	slight	Sask.	0.8
Que.	slight	Alta.	6.2
Ont.(E)	slight	B.C.	?
Ont.(S)	slight		

Ont.(N) "Rhizoctonia is more prevalent than in 1919 throughout Northern Ontario. The average percentage of hills affected by Rhizoctonia in Northern Ontario was about 3%. From 7 - 10% of the tubers show sclerotia". - Tucker.

The tubers show sclerotia." - Tucker.

Man. "Rhizoctonia caused a great deal of damage the past year, and no portions of Manitoba are known to be free from this trouble. Dry stem rot caused many misses in the fields, and commonly attacked the underground parts during the growing season. The tubers in a large percentage of cases bear the sclerotia of the fungus. Seed treatment is apparently rarely practised at present." - Bisby.

Alta.& Sask. "Rhizoctonia solani was very severe, much more severe than usual. It is difficult to estimate the percentage of loss due to this disease, but it must be very great." - Fraser and Bailey.

B.C. "Corticium Vagum Solani is also general; no estimates have been made on the injury from this disease." - Eastham.

Scab caused by Actinomyces scabies (Thax). Güssow.

Man. "Scab caused by Actinomyces scabies is common. Seed treatment is scareely practised." - Bisby.

Alta. & Sask. "Scab was very common." - Fraser and Bailey.

B.C. "Scab is generally prevalent." - Eastham.

Blackleg caused by Bacillus atrosepticus Van Hall.

This disease although commonly present everywhere did not assume great importance. The figures given below give only the average of percentages found on one inspection in the field and give no good idea as to the total loss later in the season and at digging time.

[illegible]

P.E.I.	0.27	Ont.(N)	0.90
N.S.	0.15	Man.	0.33
N.B.	0.29	Sask.	0.57
Que.	0.57	Alta.	0.54
Ont.(E)	0.14 (very early)	B.C.	----
Ont.(S)	0.14 (very early)		

Ont.(N) "Blackleg shows a decided increase over that found in 1919 where the weather was wet and cool early in the season. Mostly occurs late in the season and such potatoes are left in the field, Stored potatoes showed an average of 0.5% blackleg." - Tucker.

Man. "Some blackleg occurred early in the season; but the dry season apparently checked it, so that little loss occurred." - Bisby.

Sask.& Alta. "Blackleg was not so common as in the previous season, but in some places caused serious loss." - Fraser and Bailey.

Tip burn and hopper burn.

Tip burn and hopper burn were negligible factors this season according to reports received. The following are average estimates made in the certified seed survey:

P.E.I.	very slight	Ont.(N)	slight
N.S.	very slight	Man.	very slight
N.B.	very slight	Sask.	slight
Que.	slight	Alta.	very slight
Ont.(E)	slight	B.C.	?
Ont.(S)	slight		

Ont.(N) "Tip burn has been observed in all district but appears to be most prevalent where the season has been a long dry one. It has been observed also in fields where the weather was wet and cold, and in these case the Leaf Hopper has been found to be present in fair quantities, which leads one to the conclusion that they may be the cause of Tip Burn to some extent, but are certainly not responsible for all the tip Burn seen, as I have been in many fields and made careful search where Tip Burn was present, and found none at all, or so scarce that they could not possibly have been responsible for the amount of injury seen." - Tucker.

Man. "Tip burn scarcely occurred. Leaf hoppers were found, but not in abundance, although aphids were abundant." - Bisby.

Mosaic (cause undetermined).

This disease was much less prevalent than last year except in Norther Ontario. The following figures from the 1919 and 1920 seed certification surveys for all varieties show the percentage of plants which showed definite mosaic symptoms:

	1919	1920		1919	1920
P.E.I.	2.9	1.19	Ont.(N)	2.0	4.29
N.S.	11.5	2.59	Man.	3.5	0.74
N.B.	12.5	1.50	Sask.	8.4	0.29
Que.	16.5	1.55	Alta.	--	0.09
Ont.(E)	--	1.42	B.C.	--	(see below)
Ont.(S)	--	0.94			

From the 1919 figures for New Brunswick and Quebec and the 1918 figures for Southern Ontario, Mr. P.A. Murphy estimated the following losses due to mosaic.

Prov.	Year	%plants affected	%loss in crop	Loss in bushels	loss in dollars
N.B.	1919	12.5	5.	525,000	525,000
Quebec	1919	16.5	5.	1,000,000	1,000,000
S.Ontario	1918	7.0	2.5	478,000	478,000

Ont.(N) "Mosaic has increased over 1919 throughout Northern Ontario, being somewhat more severe in the East than in the West." - Tucker.

Man. "Mosaic is not uncommon, but was found in 1920 to be not nearly so common as leaf roll. Some plants showed the "mosaic dwarf" appearance." - Bisby.

B.C. "Mosaic appears to be rather widely distributed but of slight intensity. The worst cases have been noticed in the Lulu Island districts during the past season where occasionally 25% or more of the plants showed it". - Eastham.

Leaf roll(cause undetermined).

This disease was apparently not so serious this season as it was in 1919 except in Quebec and Northern Ontario where an increase was recorded. This disease together with mosaic and blackleg were as usual the principal causes of reduced yields (up until digg-

	1919	1920		1919	1920
P.E.I.	.03	.42	Ont.(N)	.9	2.55
N.S.	1.1	.24	Man.	8.4	.53
N.B.	1.1	.16	Sask.	11.9	.43
Que.	.05	1.33	Alta.	---	.06
Ont.(N)	7.2	4.19	B.C.	---	---
Ont.(S)		1.3			

Man. "Most of Manitoba potatoes appear to be quite badly affected with leaf roll. It was found occurring from a trace to 50% or more. The Horticulture Department is arranging for the distribution of certified seed to a few centers throughout the province. It is hoped that healthier, more vigorous stock may soon be generally grown", - Bisby.

Based upon previous estimates and experimental evidence that the yield is reduced from 3/5 to 4/5 in "leaf rolled" hilled, the approximate percentage reduction in yield for the different provinces follows:

P.E.I.	.26 to	.34	Ont.(N)	1.53 to	2.04
N.S.	.15 to	.20	Man.	.33 to	.44
N.B.	.09 to	.12	Sask.	.25 to	.34
Que.	.81 to	1.07	Alta.	.03 to	.04
Ont.(E)	2.52 to	3.36	B.C.	---	---
Ont.(S)	.78 to	1.04			

-RHUBARB DISEASES-

Alta. & Sask. "A disease of rhubarb, probably bacterial was quite severe in some gardens at Indian Head and Scott in Saskatchewan". - Fraser and Bailey.

-TOMATO DISEASES-

Leaf blight caused by Septoria lycopersici Speg.

Ont.(E) Slight amount in a few fields. In one case a loss of 25%.

Ont.(S) Not uncommon, moderate infection in many fields.

Man. "Not found." - Bisoy.

B.C. "Has not been recorded in B.C.". - Eastham.

Western blight (cause undetermined).

B.C. "very serious in the S. Okanagan, not infrequently causing 20 - 25% loss." -Eastham

Mosaic (cause undetermined).

Ont.(E) In over 50 fields examined, mosaic was found in 15 fields, mostly showing only a few diseased plants.

Ont.(S) Not uncommon but only slight injury caused.

Man. "Not found". - Bisby.

"Two fields with slight amount, 0.5 to 2%." - Wilcox

Blossom-end rot (non-parasitic)

Ont.(E) In over 50 fields examined blossom-end rot was common with an average loss of about 3%.

Ont.(S) In over 50 fields examined in Southern Ontario principally in the Niagara Peninsula blossom-end rot was found only in a few fields and was causing only a slight loss.

Man.. "Blossom-end rot was the worst tomato disease. It was probably favoured by the very dry summer.

It was sent in from Dauphin and other parts of the province and occurred also in the greenhouses." - Bisby.

B.C. "General and especially injurious in the irrigated sections where most of the commercial crop is raised." - Eastham.

Black-rot caused by Alternaria solani

Ont.(E) This disease caused an average of about 3% loss and was prevalent throughout Leeds and Frontenac Counties.

Ont.(S) Common, causing 2 to 5% loss.

Man. "Not found." - Bisby.

Survey of the

PREVALENCE OF COMMON PLANT DISEASES

in the

DOMINION OF CANADA

1921

Second Annual Report

Division of Botany
Experimental Farms Branch
Department of Agriculture.

Reports were made to the plant disease survey committee of the Canadian Phytopathological Society by the following:

Mr. I.L.Connors, Plant Pathologist, Dominion Laboratory of Plant Pathology, Brandon, general report for Manitoba.

Mr. J.W.Eastham, Provincial Plant Pathologist, Vancouver, general report for British Columbia.

Mr. Herbert Groh, Plant Disease Inspector, Division of Botany, (Ottawa), report on potato diseases for Manitoba.

Prof. J.E.Howitt, Ontario Agricultural College, Guelph, report on cereal diseases for Ontario.

Prof. W.T. MacClement, Queen's University, Kingston, report for Frontenac County.

Mr. J.B. MacCurry, Plant Pathologist, Dominion Laboratory of Plant Pathology, Charlottetown, general report for Prince Edward Island and Nova Scotia.

Signed.

W.H.Rankin,

W.P.Fraser,

Committee.

CEREAL DISEASES

WHEAT

Stem rust, caused by Puccinia graminis

Nova Scotia-

Common but not serious. Average infection 4.6%.

Prince Edward Island-

Very little damage was caused by stem rust on account of the dry weather conditions. In no instance was the wheat crop found to be severely attacked.

Ontario-

Oxford County; very prevalent.

Simcoe County; very little damage.

Norfolk County; prevalent but apparently causing little reduction.

Welland County; seventy-five percent of wheat affected, estimated reduction in yield about 2%.

Waterloo County; very severe, estimated reduction in yield 33%.

Lennox and Addington County; prevalent, estimated reduction in yield about 1%.

Algoma District; considerable stem rust.

Manitoba-

Dr. Bisby observed pycnia on the barberry at the Manitoba Agricultural College, Winnipeg, on May 27 and open aecia on June 1. Wherever barberry

bushes were observed, they were found to be rusted, frequently quite severely, and the aecia were freely sporulating during the greater part of June. Near these barberry bushes at the College, Hordeum jubatum was found rusted by June 15; but, except for this local infection, stem rust was not observed in the Province until June 27 at Emerson. During the week, June 29 - July 5, a scattered infection was found at Cartwright, Deloraine, Souris, Brandon and Rapid City; but none was recorded at Minnedosa and Neepawa. On July 8, a slightly heavier infection was reported for Portage la Prairie; and on the 11th, rust was visible at Winnipeg. It was present at Dauphin about July 15 and at Swan River on July 31. From the observations made this year, there seems to be no evidence that the rust appears earlier in the Red River Valley and then spreads in a north-westerly direction. The appearance of stem rust in the western part of the Province was rather earlier than in the east. The loss from stem rust was very difficult to estimate on account of other agencies taking a toll - such as drought. Undoubtedly, late seedlings and wheat planted in districts where moisture was abundant suffered considerably. The yield in the northern part of the Province has been reported to be cut in half. The loss from stem rust, based on the Manitoba "Free Press" annual report from 74 localities,

would be 15% of the crop - approximately a loss of nearly seven million bushels.

Saskatchewan and Alberta.-

The first collection of stem rust in Saskatchewan was made at Grenfell in southern Saskatchewan on July 5. At this date a few pustules could be collected here and there over a wide area. A few days later collections were made at Melville and further north. The rust spread rapidly and became severe in southern and eastern Saskatchewan. It is difficult to estimate the losses due to rust, but in southern Saskatchewan the yield was much below expectation. As this reduction of yield was in the districts where rust was most prevalent, doubtless this reduction in yield was due in a large measure to rust. The leaf rust (Puccinia triticina) as noted later, appeared very early and was very severe. This rust was probably also partly responsible for the lessened yield. An unusual feature of the rust attack this season was the patchy nature of infection. Some localities or fields suffered severely and neighboring districts, or adjacent fields, suffered little. On the whole, it does not seem an over estimate to place the loss due to rust in south-eastern-Saskatchewan at 20%; in some districts it was

probably much greater. In northern Saskatchewan the hot dry weather in August checked the rust, so that little damage was done. Dr. Seager Wheeler's summary of the rust situation in the Rosthern district, is true for northern Saskatchewan according to the writer's observations. Writing of the rust he says:

> "There is no doubt it caused a slight shrinkage of the grain, though I am not sure but that this was due to the hot dry weather. The stem rust in its action was very erratic this season. Instead of spreading uniformly through the crops, it appeared in small patches of not more than a few feet square, while the surrounding crops were only slightly affected. The rust did not spread owing to the hot dry weather in August, as there was no rain or dew or fog for about three weeks."

Stem rust was rare at Scott in West Saskatchewan and the region, as the rainfall was less than in most of Saskatchewan. Only traces of stem rust were found at Vermilion on August 16, and none at Edmonton and Lacombe a few days later. Mr.Sanford reports stem rust in the Edmonton district as very rare and no damage. Damage due to rust was reported to Mr. Sanford from Lloydminister in Alberta, but he was not able to get time to investigate and verify the reports.

Leaf rust, caused by Puccinia triticina

Nova Scotia-

No appreciable damage caused. Leaf surface affected 6.1%.

Prince Edward Island-

Very prevalent - numerous fields in all parts of the province ranging from 60 - 90% infection. It would, however, be difficult to estimate the damage owing to drought.

Manitoba-

Leaf rust made its appearance about two weeks previous to that of stem rust. It occurred not only abundantly on the leaf; but also on the sheath. Considerable confusion of the stem and leaf rust may be made. Leaf rust, although extremely abundant as the season advanced, caused a loss estimated at two percent.

Saskatchewan and Alberta-

This rust was severe in Saskatchewan and extended in a mild form into Alberta. It was the most severe attack of leaf rust that has occurred in western Canada for a number of years at least.

Loose smut, caused by Ustilago tritici

Nova Scotia-

Common. One report 14%; average infection 5.2%.

Prince Edward Island-

General throughout the province. Loss about 2.5%.

Ontario-

Southern part of province; surveys showed an average of about 3%. Northern part of province; surveys showed an average of about 2%.

Manitoba-

Loose smut was present in all parts of the Province from a trace to two percent. Three reports of 5% and 6% were recorded.

Saskatchewan and Alberta-

Mr. DeLong reported about 1% in the Lacombe district. Mr. Sanford reported the amount varying from no infection to 5%, many fields almost free. In Saskatchewan, the average infection would be about 1%.

Bunt caused by Tilletia laevis and T.tritici

Prince Edward Island-

General, but not severe. Damage about 2%.

Manitoba-

This smut was not found; but no doubt, occurs to a limited extent. Much of the wheat planted is treated with formalin.

Saskatchewan and Alberta-

Very little of this smut observed or reported. Seed treatment of wheat is general in the better farming district. "Noticed in one field about 2%; in another 10% (Sanford)."

Scab, caused by Gibberella saubinetii.

Prince Edward Island-

This disease occurred only to a very slight extent, only a few specimens being collected. Weather conditions prevented its usually general appearance.

Manitoba-

Scab was found on the plots at the Manitoba Agricultural College, Winnipeg. Ruby wheat showed 10%; while other varieties showed smaller percentages. Corn stubble was examined for the perfect stage; but none was observed.

Saskatchewan and Alberta-

A few collections were made in southern Saskatchewan and at Saskatoon and Rosthern. It was, however, rare, only a few heads here and there could be found. Not reported from Alberta.

Minor diseases of wheat.

Ontario-

There was present in northern and southern Ontario considerable leaf stripe, due to Helminthosporium.

Manitoba-

Blight (Helminthosporium sativum),--H.sativum caused considerable leaf injury; eighty percent (80% of the nodes and many of the heads of the Durum wheat on the experimental plots were

attacked more or less severely. The nodes of some of the stems were attacked so early that the head did not fill. Traces of Helminthosporium were observed on wheat throughout the Province and showed signs of causing severe damage at one place visited.

White tip (physiological) --This was prevalent in the drought-affected areas of the Province.

Saskatchewan and Alberta-

Root Rots ---These were found in some districts in Saskatchewan, probably due to Helminthosporium. Also reported from Alberta by Sanford.

Glume spot due to Septoria. No collections were made.

Basal Glume Rot, due to Bacterium atrofaciens.----- This disease was much more common in Saskatchewan than usual throughout the districts where the rainfall was above the average. In some plots it ran as high as 10%.

Powdery mildew due to Erysiphe graminis.....Collections on wheat were made at Edmonton, Alta. It did no serious damage.

Stripe rust, (Puccinia glumarum) --- No collections were made this season.

OATS.

Stem rust, caused by Puccinia graminis.

Nova Scotia-

General and occasionally severe. Several fields showed 25% infection. Average 8.1%.

Prince Edward Island-

This disease, although not general, was severe in a few instances.

Ontario-

Halton County; stem rust and leaf rust estimated together as causing 30% reduction in yield.

Welland County; estimated reduction in yield about 2%. Average percentage infection in the field 75% of the stools.

Waterloo County; very severe.

Algoma District; considerable stem rust.

Manitoba-

Stem rust appeared much earlier than in the season of 1920. Wild oats were found rusted on June 27, 1921, at Emerson, Man. A loss of 5% occurred this season.

Saskatchewan and Alberta-

Common over the same area as Wheat stem rust, in some places doing serious damage.

Leaf rust, caused by Puccinia coronata

Nova Scotia-

Very common and often severe. Twenty-nine reports averaged 18% of the leaf area affected.

Prince Edward Island-

General, especially in Queen's County, but not severe.

Ontario-

Bruce County; estimated reduction in yield 20%.

Leeds County; estimated reduction in yield 15%.

Lennox County; average reduction in yield about 5%, as high as 20% in some fields.

Prince Edward County; estimated reduction in yield 50%.

Lambton County; very prevalent.

Halton County; leaf and stem rust caused estimated reduction in yield of 30%.

Middlesex County; estimated reduction in yield 15%.

Kent County; very prevalent.

Grenville County; 5% of crop affected, damage not serious.

Wellington County; 60% affected, reduction in yield about 5%.

Simcoe County; very severe, estimated reduction in yield about 50%. Late oats practically total loss.

Lincoln County; estimated reduction in yield from 5 to 10%.

Oxford County; prevalent.

Huron County; very severe, estimated reduction in yield 25 to 50%.

Algoma District; very light attack.

Kenora District; reduction in yield about 15 to 20%.

Rainy River; reduction in yield about 20%.

Manitoba-

Leaf rust appeared about the same time as the stem rust. It was fairly prevalent over the Province, but caused very slight loss.

Saskatchewan and Alberta-

Present in Saskatchewan, but not severe.

Smut, caused by Ustilago levis and U. avenae.

Nova Scotia-

This disease was very prevalent ranging from .5 to 20% infection. Thirty-seven reports averaged 5.3%.

Prince Edward Island-

Common, causing considerable damage. Infection from 1 to 23%.

Ontario-

Oat smut was as usual the most important of the cereal smuts. Actual counts made in Wellington County and believed to be typical for the Province.

Variety	%Smut
White cluster	0.0
Banner	0.03
Banner	trace
O.A.C. No. 72	trace
Banner	18.0
Marmoth cluster	trace
Banner	19.8

In Frontenac County the losses ranged from 5% to 15%. An average of 5% oat smut loss is estimated for the Province. The following counts were made in northern Ontario.

Locality	%Smut
Emo	8.0
Kenora	5.0
Kenora	4.5
Kenora	3.5
Rainy River	6.0
Eagle River	20.0
Port Arthur	2.0
Murillo	2.0
Fort William	6.0
Fort William	10.0
Fort William	1.0

Manitoba-

Traces of smut were observed in the Province generally; but in only a few cases could the loss be estimated. The oat smuts are easily controlled; but the growers do not treat their grain every season, which accounts for the appearance of these smuts.

Saskatchewan and Alberta-

DeLong reports only about 1 - 10% in the Lacombe district. General, but usually the percentage small, not averaging more than 2 to 3%.

Minor diseases of oats.

Manitoba-

Spikelet sterility occurred throughout the Province, especially in the dry parts. One field showed from 25 to 30% loss.

Saskatchewan and Alberta-

Root rot was severe on a small plot at Saskatoon, about 50% due to a Fusarium. Reported from the Edmonton district by Sanford.

BARLEY

Stem rust, caused by Puccinia graminis

Prince Edward Island-

This disease was common wherever the host was grown, but caused little damage.

Ontario-

Huron County; prevalent.

Simcoe County; very little damage.

Norfolk County; prevalent, but apparently causing little reduction in yield.

Welland County; seventy-five percent infection, estimated reduction in yield about 2%.

Halton County; reduction in yield of 15% or more.

Waterloo County; very severe, estimated reduction in yield about 33%.

Lennox and Addington Counties; prevalent, causing about 1% reduction in yield.

Manitoba-

Barley was as heavily rusted with stem rust as usual; but 5% reduction of yield would cover the loss.

Saskatchewan and Alberta-

Common over the same area as Wheat stem rust, but apparently doing little damage.

Loose smut, caused by Ustilago nuda.

Prince Edward Island-

General throughout the province, infection varying from .5% to 1.0%.

Ontario-

Loose smut of barley was present to the average extent of about 4% in southern Ontario and about 2% in northern Ontario.

Manitoba-

Loose smut was observed less frequently than in the previous year. In a large number of fields observed it was absent or only a trace present. One instance of 5% was noted.

Saskatchewan and Alberta-

General. In a few fields very severe; in some as high as 30%.

Covered smut, caused by Ustilago Hordei.

Prince Edward Island-

Not observed.

Ontario-

Reported from Frontenac County as more prevalent than usual but not causing more than 5% loss.

Saskatchewan and Alberta-

General, but usually only a small percentage. In some fields 10%.

Stripe disease, caused by Helminthosporium gramineum

Nova Scotia-

Very prevalent practically throughout the Province. Usually about 30 - 50% of leaves affected.

Manitoba-

Stripe was not serious in Manitoba this year.

Saskatchewan and Alberta-

This disease was rather common in northern Alberta, but usually percentage was not high. Present, but not severe in Saskatchewan.

-Spot blotch caused by Helminthosporium sativum-

Manitoba-

Spot blotch averaged seven and one-half percent in the twenty fields in the area mentioned under net blotch; one field gave 40% infection.

Saskatchewan and Alberta-

Common in Saskatchewan and in northern Ontario, in some places severe and causing injury.

-Net blotch caused by Helminthosporium teres-

Manitoba-

An average of 10% infection was found in the fields surveyed in the country south of the C. P. R. line to Saskatoon, Sask. The maximum infection was 40%. At the Experimental Farm, Brandon, Man., barley varieties on the plots ran from 15% to 100% affected ---Manchurian and Stella were particularly susceptible.

-Ergot caused by Claviceps purpurea-

Manitoba-

A trace of ergot was observed on the barley at the Experimental Farm.

CORN

-Smut caused by Ustilago zeae-

Manitoba-

This smut was widely distributed; but generally it caused no more loss than last year.

-Rust caused by Puccinia sorghi-

Manitoba-

Rust made its first recorded appearance in Manitoba at the Agricultural College this year. It caused an infection as severe as the writer has ever seen.

RYE

-Stem rust caused by Puccinia graminis-

Manitoba-

Stem rust was present in very sparing quantity on spring rye.

It develops only late in the season.

-Leaf rust caused by Puccinia dispersa-

Manitoba-

Leaf rust was very common; but it causes little damage.

Saskatchewan and Alberta-

"Slight to severe in a number of fields in Edmonton district; no serious damage." (Sanford).

-Flag smut caused by Urocystis occulata-

Manitoba-

This smut was absent this year, as last.

Saskatchewan and Alberta-

About half-a-dozen heads were collected in southern Alberta.

There were no other reports of this disease.

Ergot, caused by Claviceps purpurea

Manitoba-

Ergot occurred commonly in rye; but the percentage of loss is small.

Saskatchewan and Alberta-

Generally distributed, but not common enough to cause serious injury. "General about Edmonton, but probably less than 1% (Sanford)."

FORAGE CROP DISEASES

ALFALFA

Leaf spot, caused by Pseudopeziza medicanginis

Prince Edward Island-

Infection was general, but little apparent damage resulted.

Manitoba-

This disease was quite common; but no great amount of damage was caused.

British Columbia-

Fairly general, but can hardly be described as serious.

Downy mildew, caused by Peronospora trifoliorum

Manitoba-

This disease was found at Brandon. It caused only a slight amount of yellowing of the leawes.

Root rot, caused by Sclerotinia trifoliorum

British Columbia-

This disease was found to be doing severe injury to alfalfa and red clover on a limited area at Duck Lake and Creston in East Kootenay.

AWNLESS BROME GRASS

Leaf spot, caused by Septoria sp.

Manitoba-

A septoria leaf spot on brome was found widespread.

Only occasionally can the fruiting stage be found; but heavy spotting of brome grass leaves appears to be due to this organism.

CLOVER

Rust, caused by Uromyces trifolii

Manitoba-

Uromyces trifolii occurred commonly on White Clover, killing some if the leaves.

SUNFLOWER

Rust, caused by Puccinia Helianthi

Manitoba-

Rust was more serious than last year; the leaves were heavily attacked with uredinial and telial stages and the lower leaves were killed.

Saskatchewan and Alberta-

General on sunflowers in Saskatchewan, but not doing very serious damage.

Wilt, stem rot or root rot, caused by Sclerotinia sp.

Manitoba-

A field at the Manitoba Agricultural College, planted to sunflowers last year was planted again. The sunflowers were attacked by wilt and stem rot in the same localized areas as were attacked last year. It evidently lives over in the soil by means of the sclerotia. Iva zanthifolia was attacked sparingly when in close association with the sunflowers.

Saskatchewan and Alberta-

A few infected plants were found at Edmonton, but the fungus seems distinct from the common Sclerotinia attacking sunflowers. Not collected elsewhere, this season.

Powdery mildew, caused by Erysiphe cichoracearum

Manitoba-

Powdery mildew made its appearance in the latter part of August, but it was very local.

TIMOTHY

Rust, caused by Puccinia graminis Phlei-pratense

Saskatchewan and Alberta-

Collected on timothy late in season in the Edmonton district. Not as common as usual.

WESTERN RYE GRASS.

Smut, caused by Ustilago Agropyri.

Saskatchewan and Alberta-

Not collected this year except on experimental plots.

FRUIT DISEASES

APPLE

Scab, caused by Venturia inaequalis

Nova Scotia-

Owing to the unusually dry spring and summer, scab was found to be much less severe than usual. In unsprayed orchards, however, leaf and fruit infection averaged 13.5% and 38.7% respectively.

Prince Edward Island-

Scab was of comparatively little economic importance this year. Unsprayed trees showed from .5 to 7.5% infection. Sprayed trees examined were almost entirely free.

Ontario-

Scab was severe in southern Ontario. The following results of comparative dusting and spraying at Newcastle show the high percentages of scab and the ineffectiveness of the two dusts used. These tests were conducted by Mr. W.A.Ross, Dominion Entomological Branch.

Variety	Material	Scab %
McIntosh	Copper Arsenic Dust	92.92%
McIntosh	Sulphur Leaf Dust	76.46%
McIntosh	X Liquid Spray	7.05%
Stark	Copper Arsenic Dust	82.93%
Stark	Sulphur Lead Dust	74.12%
Stark	Lime Sulphur	2.91%
Spy	Copper Arsenic Dust	11.37%
Spy	Sulphur Lead Dust	13.26%
Spy	X Liquid Spray	3.09%

X First two sprays, Bordeaux mixture, third or post-blossom lime sulphur.

In Frontenac County and vicinity scab was prevalent on the more susceptible varieties. Loss where not sprayed was from 10% to 50%.

Manitoba-

Scab, Venturia inaequalis. A considerable amount of scab occurred on the leaves and fruit of the crab apple.

British Columbia-

Taking the Province as a whole there was a little less than the usual amount of this disease. Owing to spraying for the disease being practically universal in the fruit growing districts it is difficult to estimate the natural prevalence of the disease. In the Kootenay Lake district McIntosh Red sprayed only in the "pink" showed 51% of the fruit infected. Some trees of this susceptible variety showed as high as 25% infection where three sprayings had been given.

Twig blight, caused by Bacillus amylovorus.

Nova Scotia-

Very little of this disease was reported this year.

Prince Edward Island-

Present to a slight extent in a few orchards.

Ontario-

Considerable amount throughout the Niagara fruit district, where pears are planted abundantly. In some cases it was so severe as to cause damage to the trees, although on the whole it was not destructive. More common and severe than in 1920.

Manitoba-

This disease was sent in from Winnipeg and Carman, Man., in July. The damage seemed to be severe and it may have been here for some time.

Anthracnose, caused by Neofabraea malicorticis

British Columbia-

It was anticipated that this disease would be much more severe in its effects than usual during 1921, owing to the early and exceedingly heavy and continuous rains in the fall of 1920. Infection takes place with these fall rains and it was feared that many growers would be caught unprepared. However, in the coastal region, where the disease is chiefly found, it does not seem to have been materially worse. It is on the increase and will necessitate spraying at Salmon Arm in the Interior where it has hitherto been considered negligible. It is of much interest to find that Duchess trees at Vernon in the Dry Belt showed a serious development of cankers last year due to infection in the fall of 1920. This is the first case of the disease being of any importance in the irrigated country and is no doubt the direct consequence of the unusually heavy fall rains.

Mildew, caused by Podosphaera leucotricha.

British Columbia-

Until about three years ago this disease was not considered of any consequence and it is stillof

little importance where climatic conditions render regular spraying for scab a necessity. In the "dry belt" however where scab is almost or quite absent the disease is on the increase and is creating considerable alarm. So far there has been comparatively little direct injury to the fruit but the stunting of the growth, while difficult to estimate, is often very marked.

Black rot canker, caused by Physalospora cydoniae

Nova Scotia-

From reports and observations this disease appears to be prevalent throughout a wide area in the Annapolis Valley, causing considerable damage to leaves and twigs. Leaf infection varied from .005% slight to 55% severe, averaging 8.85%. Twig infection varied in severity from 3% to 25% averaging 13.1%.

European canker, caused by Nectria galligena.

Nova Scotia-

This disease was found to be very prevalent in the Annapolis Valley and other points, causing considerable twig injury.

CHERRY.

Brown rot caused by Sclerotinia cinerea.

Nova Scotia-

Reported severe in several localities, loss varying from 3 to 30%.

Ontario-

Severe on sweet cherries and important in localities on sour cherries in the Niagara fruit district. There was only about a 30% crop set on sour cherries because of late frost injury. Many trees of sweet cherries were not picked because of brown rot and sour cherries rotted badly in the baskets. The actual loss varied greatly, from none to 100% in different localities and orchards.

British Columbia-

There is no record, as yet, of this disease in the areas of commercial cherry cultivation, though it is common in the coastal area. The blossom blight of sour cherries associated with this disease and reported last year was again severe in the same area (Cormorant Bay, Victoria) and will necessitate experimental work for control.

Leaf spot or yellow leaf, caused by Coccomyces spp.

Nova Scotia-

This disease was more or less general. Leaf infection varied from .02 to 25%, averaging 3.8%. The resulting damage, however, would be difficult to estimate.

Ontario-

Severe on sweet cherries in some localities and some damage on sour cherries. Bordeaux mixture gives good control for this disease, and lime sulphur is not so effective.

Black knot, caused by Plowrightia morbosa.

Nova Scotia-

There was a noticeable amount of this disease but damage was slight.

CURRANT

Leaf spots, caused by Mycosphaerella Grossulariae and Pseudopeziza Ribis.

Nova Scotia-

Present, but of little importance.

Prince Edward Island-

General, but caused little damage.

Ontario-

Moderate infection, general in Niagara district. Drought conditions accentuated the damage.

Manitoba-

Leaf spots were present.

Saskatchewan and Alberta-

Severe at Scott, causing defoliation.

Rust, caused by Puccinia Grossulariae

Prince Edward Island-

Found only in one instance.

Saskatchewan and Alberta-

On fruit of black currant at Scott, rather severe.

Felt rust, caused by Cronartium ribicola.

Nova Scotia-

One severe case on cultivated black currant noted at Kentville. 100% of leaves were infected moderate to severe.

Ontario-

Common in many plantings but causing little damage.

British Columbia-

This disease was discovered in September in the telial stage on black currants at Vancouver, North Vancouver, Point Grey, Huntingdon, Chilliwack, Agassiz, Victoria, Nanaimo, Courtenay and Comox, all in the Coastal area. Such scouting as was possible at this season in the interior did not reveal the presence of the disease. Infection was almost confined to R. nigrum, other varieties only showing light infection when closely adjoining heavily infected nigrum. The original source of the disease has not yet been located. Some five year old Pinus strobus in the City nursery at Stanley Park have shown the disease but these were raised from seed in B.C. Another infection on P. cembra had also taken place subsequent to planting.

GOOSEBERRY

Leaf spot, caused by Mycosphaerella Grossulariae and Pseudopeziza Ribis.

Nova Scotia-

Present, but of little importance this year.

Prince Edward Island-

General, but caused little damage.

British Columbia-

Caused a certain amount of injury at the Coast especially around Mission and Hatzie.

American Powdery Mildew, caused by Sphaerotheca mors-uvae.

Nova Scotia-

Present to a considerable extent on English varieties. One report 25% infection.

Prince Edward Island-

Two cases of slight infection were found on gooseberries.

British Columbia-

Apparently rather generally distributed. Even at Summerland one of the drier parts of the irrigated area, English gooseberries have been taken out owing to trouble with mildew. It is interesting to note that there is a plantation of the variety "Industry" at Burnaby (Lower Mainland) in which mildew has never appeared although spraying has never been followed.

GRAPE.

Dead Arm, caused by Cryptosporella Viticola.

Ontario-

Common in small percentages up to 5% in many vineyards of the Niagara district. This is uncommon for the district and was hardly noticed previously.

PEACH

Leaf curl, caused by Exoascus deformans

Nova Scotia-

Comparatively little in evidence. One report of as high as 25% of leaves affected.

Ontario-

Very severe throughout the Niagara district. Many trees lost nearly all or half their foliage. The infection period came very early after a warm period the first part of March. The large majority of growers failed to spray early enough. Those who did satisfactorily controlled it. Fall spraying is not practised in the district. Peaches set less than half a crop due to late frost injury. The trees recovered well from the curl and passed through the drought and hot weather successfully although on many days the leaves hung almost limp. The fruit which was set, reached excellent size and was of good quality.

British Columbia-

Not severe in the commercial orchards, which are confined to the southern Okanagan (Dry Belt). Quite severe elsewhere.

Brown rot, caused by Sclerotinia cinerea.

Ontario-

Very little damage on fruit.

British Columbia-

Does not occur in the commercial peach area.

Scab, caused by Cladosporium carpophilum.

Ontario-

Abundant fruit infection on some varieties, reducing quality but not causing much money loss because of scarcity of the crop. No control measures are used for this disease in the Niagara district.

Powdery mildew, caused by Sphaerotheca pannosa

British Columbia-

Some years ago this was causing a good deal of loss, chiefly spoiling fruit for shipping purposes. Since the inauguration of compulsory spraying against the peach worm (usually strong lime sulphur when blossoms are showing pink) in the commercial peach area there has been a noticeable decrease in this disease.

PEAR.

Twig blight, caused by Bacillus amylovorus:

Nova Scotia-

This disease was found in a few orchards averaging .7% twig infection.

Ontario-

Very common and severe in the Niagara district.

British Columbia-

In most areas this disease is now fairly well under control but there has been some severe injury to pears in the southern Okanagan and a severe outbreak on both apples and pears at Kelowna. A little blight has occurred on the

Kootenay Lake one or twice during the last seven or eight years but was apparently eradicated. This year it appeared in a more severe form at a number of points in and around the city of Nelson, and one block of 50 pear trees will probably have to be taken out. This year also a severe case of blight was found in an orchard at Cranbrook, in the Crow's Nest Valley. Both apples and pears were severely affected, some trees being beyond saving. This is much further east than any previously recorded infection and it is of great practical importance since the important apple section of Creston and district lies between Nelson and Cranbrook, Blight has never been recorded in this district as yet but it is now exposed to infection from both East and West. The first epidemic of the disease at Salmon Arm occurred this season, a number of trees of the more susceptible varieties being destroyed. A little blight has been found here for the past few years and the present severity is in part at least, due to ignorant handling of the disease, especially as regards disinfection and sucker infection.

Scab, caused by Venturia Pyrina.

Nova Scotia-

This disease was occasionally severe on the leaves, but comparatively little fruit injury was reported.

Ontario-

Common and severe in many localities.

British Columbia-

There was less of this disease than usual.

Leaf spot, caused by Mycosphaerella sentina

Nova Scotia-

Very little in evidence. Occurrences averaged 9% leaf infection.

PLUM.

Brown rot, caused by Sclerotinia cinerea.

Nova Scotia-

Occasionally severe. One report recorded 40%. Average, however, was low.

Ontario-

Not important.

Plum Pocket, caused by Exoascus Pruni.

Nova Scotia-

Although not generally distributed several severe infections were reported, 7 to 60%. Average loss about 6%.

Ontario-

Not common.

Manitoba-

This disease was very common at Winnipeg.

Saskatchewan and Alberta-

Plums at Rosthern were severely attacked by this disease.

Black knot, caused by Plowrightia morbosa

Nova Scotia-

Several severe cases were reported from the Annapolis Valley.

Prince Edward Island-

Several severe cases were observed in neglected trees. About 5% twigs affected.

Manitoba-

Black knot occurs sparingly on wild plums and cherries throughout the Province.

British Columbia-

A case of Plowrightia morbosa, the first I have seen in the Province, on cultivated plums or cherries was found this year near Vancouver. A form which appears morphologically identical is common on choke-cherries around Vernon but there is no record of its occurrence on cultivated varieties.

RASPBERRY.

Leaf curl, infectious but cause unknown.

Nova Scotia-

Present but not general. Four reports recording this disease averaged 5% of bushes affected usually severe in form, causing a loss to that extent.

Prince Edward Island-

This disease was found wherever Cuthbert raspberries were grown. Affected canes averaged 6%.

of the planting, the loss would be about the same figure. Herberts were entirely free. Occasional cases of leaf curl were found among wild raspberries.

Ontario. About the same loss in the Niagara district as in years previous. The following table shows the loss from leaf curl in the townships of Lincoln, Wentworth and Halton Counties which border on Lake Ontario. Missing bushes in variety Cuthbert are largely due to roguing for leaf curl and the percentages are shown together with the approximate total leaf curl loss for the past two or three years.

Average percent of leaf curl in Lincoln, Wentworth and Halton Counties.

	Cuthbert % Curl	Cuthbert % Missing	Cuthbert %Loss 2-3yrs.	Marlboro % Curl	Herbert %Curl
Grantham Tp.	3.5	1.4	4.9	-	0.0
Louth Tp.	2.1	4.4	6.5	0.0	-
Clinton Tp.	4.2	6.0	10.2	2.5	0.6
Grimsby Tp.	6.1	7.6	13.7	-	1.5
Saltfleet Tp.	4.0	5.1	9.1	-	0.0
Burlington Distr.	2.9	8.0	10.9	0.5	0.0
Oakville Distr.	3.8	7.0	10.8	0.2	0.0
General average	3.8	5.6	9.4	0.8	0.3

Mosaic, infectious but cause unknown.

[illegible]

[illegible]

[illegible]

Nova Scotia-

This disease appeared to be more or less general in distribution, but did not cause much immediate damage.

Prince Edward Island-

This disease was general, averaging 17%.

Ontario-

This disease is epiphytotic in the Niagara fruit district. The following table shows the average percentage of the stand affected in the various townships. The Herbert seems to be "commercially resistant" except when planted in close proximity to Cuthbert or Marlboro.

District	Variety	%Mosaic	% Healthy
Grantham	Cuthbert	20	70
	Herbert	6	93
Louth	Cuthbert	20	74
	Marlboro	40	60
Clinton	Cuthbert	28	62
Grimsby	Cuthbert	27	60
	Herbert	1	93
Saltfleet	Cuthbert	18	73
	Herbert	1	98
Burlington	Cuthbert	20	70
	Marlboro	40	55
	Herbert	1	98
Oakville	Cuthbert	9	80
	Marlboro	20	77
	Herbert	0	99

The following notes on the presence of raspberry mosaic in different sections of Ontario show at least that this disease is found generally wherever raspberries are grown. It is not an important disease, however, in Norfolk, Middlesex and Frontenac Counties where representative plantations were seen. The reports from other sections are merely notes and no careful survey has been made.

Brant County, (near Brantford).

One plantation of Cuthbert, 2% mosaic.

Plantation of Herbert, no mosaic.

Norfolk County, (near Waterford).

Six large Cuthbert plantings, no mosaic in five and 1% in one.

One Herbert planting, no mosaic.

Norfolk County, (near Simcoe).

Small plantation, Cuthbert, 3% mosaic.

Middlesex County (near London).

Three large Marlboro plantings, no mosaic in two and 1% in one.

One Cuthbert planting, 2% mosaic.

Kent County (near Blenheim).

One plantation, Cuthbert, 5% mosaic.

Frontenac County (near Kingston).

One plantation, Columbia, 3% mosaic.

One plantation, Herbert, no mosaic.

One plantation, Cuthbert, 0.5% mosaic.

Algoma District (near Sault Ste Marie).

One plantation, 60 - 70% mosaic.

Thunder Bay District (near Dorion, Murillo and Fort William).

Three plantations, mosaic present.

Cane blight, caused by Leptosphaeria Coniothyrium

Ontario-

Severe on variety Herbert in many places in Lincoln County.

Anthracnose, caused by Gloeosporium venetum

Ontario-

Common on the variety Herbert in the Niagara district and doing some damage.

Crown gall, caused by Bacterium tumefaciens

British Columbia-

An excrescence on the canes of red raspberries similar to that commonly found on the Snider blackberry and the loganberry have been noticed during the past year at a number of points in the Fraser Valley. The organism has not been isolated from these excrescences but they would seem to be of the nature of Crown Gall.

Leaf rust, caused by Phragmidium imitans.

British Columbia-

This disease which caused some alarm on red raspberries in the Fraser Valley two years ago was quite negligible this season. It does not seem likely to prove of economic importance.

STRAWBERRY

Powdery mildew, caused by Sphaerotheca Humuli.

Ontario-

Strawberry mildew was important in certain localities in the Niagara fruit district causing some loss. Early application of sulphur dust seems to be very effective in limiting the spread of mildew.

Leaf scorch, caused by Mollisia earliana.

Ontario-

This leaf and petiole spot caused considerable losses in southern Ontario. Many plantings were severely damaged. The variety of Glen Mary seems to be very susceptible and most of the loss in the eastern part of the Niagara fruit district was in this variety. Petiole lesions early in the season were the main source of damage as well as abundant blade lesions.

Black root, caused by late freezing injury.

Ontario-

Black root was very common in southern Ontario. This trouble is due to the killing of the roots by late freezes. The damage caused by this trouble was confused with the Mollisia leaf scorch injury by the grower and called "blight". A heavy loss in crop resulted in some localities, although on the whole there was a good crop.

Leaf spot, caused by Mycosphaerella Fragariae.

Nova Scotia-

Leaf spot was not general in Nova Scotia this year. The disease was observed in a number of plantations, but only slight injury was effected.

Prince Edward Island-

Present in all strawberry patches examined, though to a comparatively slight extent.

Ontario-

Common in Niagara district but did no damage so far as observed.

Manitoba-

Present but not serious.

VEGETABLE DISEASES

BEAN

Blight, caused by Pseudomonas phaseoli

Manitoba-

Caused a small amount of damage. The dry weather prevented optimum growth in the western and southern parts of the province, but the crop was exceptionally good.

Saskatchewan and Alberta-

This disease was very severe and widespread causing heavy losses in some districts.

Anthracnose, caused by Colletotrichum Lindemuthianum

Prince Edward Island-

This disease was entirely held in check by the dry weather. Only a very few lesions were observed throughout the season.

Saskatchewan and Alberta-

Severe at Rosthern. No other collections were made.

Mosaic, infectious but cause unknown.

Prince Edward Island-

Five moderate cases of this disease were observed. Infection averaged 1.5%.

RHUBARB

Saskatchewan and Alberta-

A disease of rhubarb, probably bacterial, was quite destructive at Indian Head, Rosthern and Scott.

PEA.

Powdery mildew, caused by Erysiphe polygoni.

Saskatchewan and Alberta-

Severe in garden peas in some localities in Saskatchewan and Alberta.

Blight, caused by Ascochyta pisi.

Saskatchewan and Alberta-

Present but not severe.

PEPPERS

Manitoba-

An alternaria rot of pepper fruits occurred again this year.

POTATO.

The following data on potato diseases is drawn exclusively from the records of the field inspections made by the Division of Botany, Ottawa, in the course of the seed certification survey.

In each field (small or large) the percentage of blackleg, curly dwarf, leaf roll, mosaic, wilts, and misses are computed by actual counts, usually of 100 hills selected in each of three places in the field. Averages by counties (except for the western provinces) were obtained by adding the individual field percentages and dividing by the number of inspections made. No reference was paid to variety, date of inspection, size of plot, etc.

Where two inspections were made of the same field, the figures for both were included as if they were two separate fields. In this way many of the better fields which were granted a second inspection have a double rating, but the average is just as fair as those from first inspections only which were spread over a period of two months. Averages for provinces were obtained by totalling the individual field percentages for the province and dividing by the number of fields inspected. These averages were made in exactly the same way as those for counties. Averages for early blight, late blight, Rhizoctonia and tip burn are shown by citing the percentage of the total number of fields inspected in which each was absent, slight, moderate or severe for each province. No entry was interpreted as meaning absent. In most of the cases of fields inspected the grower had requested the service, anticipating that his field would pass for certification. In Ontario, however, a large number of fields entered in the provincial field crops competition were inspected by arrangement and the figures are included in the averages. In the case of Ontario, therefore, the averages represent a mixture of fields thought to be good enough to pass for certification and those ...

entered in competiitons, more for high yield than any other factor. In the western provinces many fields were suggested for inspection by persons asked for such lists. The service being new in these provinces, the averages represent more nearly the average crop than do the figures for the eastern provinces. Wilts include all wilting diseases except those specified. Tip burn includes hopper burn. Misses include many cases of rhizoctonia.

GENERAL SUMMARY

	No. inspection.	No. acres	Black-leg	Curly Dwarf	Leaf Roll	Mosaic	Wilts	Misses	Early Blight	Late Blight	Rhizoctonia	Ti Bu
Nova Scotia	162	303	0.08	0.0	1.82	0.67	0.2	2.62	0-Sl	0	0-Sl	0
Prince Edward Island	436	1484	0.58	0.0	0.06	2.2	1.1	4.7	0-Sl	0	0-Sl	0
New Brunswick	302	1164	0.66	0.0	1.04	3.87	0.04	4.1	0-M	0-Sl	0-M	0
Quebec	1195	3986	0.72	0.06	0.96	3.48	0.25	4.67	0-Sl	0-Sl	0-Sv	0-S
Ontario (E)	66	96	0.005	0.01	2.51	1.91	0.00	4.89	0-Sl	0	0-M	0-M
Ontario (W & S)	203	520	0.12	0.006	0.90	2.50	0.05	7.53	0-M	0	0-M	0-S
Ontario (N)	603	703	0.35	0.01	0.48	3.52	0.12	4.52	0-M	0	0-Sv	0-S
Manitoba	716	1034	0.37	0.03	1.7	0.7	0.9	2.8	0-Sl	0	Sl-Sv	0-S
Saskatchewan	114	621	1.5	0.23	0.8	2.6	0.2	2.7	0-Sl	0	Sl-Sv	0-M
Alberta	90	178	0.74	0.04	0.1	1.8	0.35	0.44	0-Sl	0	Sl-Sv	0
British Columbia	41	133	0.8	0.1	3.5	1.2	0.24	0.0	0	0	Sl-M	0

GENERAL SUMMARY

	Early Blight				Late Blight				Rhizoctonia				Tip Burn		
	Abs.	Sl.	Mod.	Sv.	Abs.	Sl.	Mod.	Sv.	Abs.	Sl.	Mod.	Sv.	Abs.	Sl.	Mod.
Nova Scotia	83.2	10.6	6.2	0.0	99.4	0.6	0.0	0.0	70.2	27.9	1.9	0.0	96.9	0.6	0.6
Prince Edward	73.6	25.2	0.7	0.4	100.	0.0	0.0	0.0	76.4	23.1	0.0	0.4	100.	0.0	0.0
New Brunswick	54.3	31.5	12.6	1.6	78.1	9.9	2.0	0.0	30.5	47.3	21.2	1.0	99.4	0.6	0.0
Quebec	78.4	15.9	4.8	0.9	94.4	4.9	0.6	0.1	51.7	29.0	12.9	6.4	86.9	11.0	2.1
Ontario	52.6	38.4	7.2	1.7	98.7	0.9	0.1	0.2	29.9	43.0	21.8	5.2	44.2	33.4	13.5
Manitoba	68.6	29.6	1.8	0.0	99.9	0.1	0.0	0.0	5.4	56.4	27.1	11.1	70.5	20.7	3.9
Saskatchewan	89.4	7.0	3.5	0.0	100.	0.0	0.0	0.0	0.0	29.8	37.7	32.5	65.7	26.3	7.9
Alberta	82.2	17.8	0.0	0.0	100.	0.0	0.0	0.0	2.2	35.5	45.7	16.7	95.6	3.3	1.1
British Columbia	100.	0.0	0.0	0.0	100.	0.0	0.0	0.0	8.6	37.1	54.3	0.0	100.	0.0	0.0

Figures refer to the percentage of the total number of fields inspected in which the four diseases, early blight, late blight, Rhizoctonia and tip burn were rated as absent, slight, moderate or severe.

SUMMARY OF TUBER DISEASE REPORTS

Percentage affected.

Prov.	No. Insp.	Bact. rot	Late blight	Net necrosis	Internal spotting	Common Scab	Rhizoctonia	Scurf
N.S.	71	0.07	0.11	0.0	0.0	2.7	1.7	0.0
P.E.I.	125	0.58	0.0	0.0	0.0	8.7	0.5	4.1
N.B.	22	0.16	1.0	0.5	0.4	3.8	1.3	0.07
Que.	197	0.08	0.2	0.24	0.07	0,4	0.3	0.0
Ont.	93	0.37	0.0	0.4	0.4	12.1	6.6	0.0
Man.	58	0.10	0.0	1.0	0.08	4.4	8.2	0.0
Sask.	16	0.06	0.0	1.5	0.06	10.7	2.7	0.0
Alta.	5	0.0	0.0	0.4	0.2	9.0	2.0	0.0

Powdery Scab

P.E.I. Seven cases, average of 4.0%.

N.B. Four cases, aver. of 3.8%.

Ont. Five cases, aver. of 0.5%.

NOVA SCOTIA

	No.	Acres	Black-leg	Curly Dwarf	Leaf Roll	Mosaic	Wilts	Misses	Early Blight	Late Blight	Rhiz-octonia	Tip Bur
Annapolis	2	1	0.0	0.0	1.5	1.5	0.15	0.0	0-Sl	0	0-Sl	0
Colchester	74	122	0.09	0.0	1.1	0.004	0.0	5.6	0-M	0	0-Sl	0
Cumberland	1	?	0.3	0.0	0.0	0.0	7.0	4.0	0	0	Sl	0
Hants	12	17	0.03	0.0	5.7	0.0	1.3	6.4	0	0	0	0
Kings	49	137	0.03	0.0	2.8	0.02	1.5	3.7	0	0	0-Sl	0-S
Lunenburg	1	1½	0.0	0.0	0.0	1.3	1.0	0.6	0	0	0	S
Pictou	22	25	0.16	0.0	3.3	4.7	1.4	7.5	0	0	0-Sl	0-S
Averages	162	303	0.08	0.0	1.82	0.67	0.2	2.62	0-Sl	0	0-Sl	0

Early blight,- Absent in most, slight to moderate in few.

Late blight,- Absent throughout.

Rhizoctonia,- Absent in most, slight in many, moderate to severe in very few.

Tip burn,- Absent throughout.

PRINCE EDWARD ISLAND

	No.	Acres	Black-leg	Curly Dwarf	Leaf Roll	Mosaic	Wilts	Misses	Early Blight	Late Blight	Rhiz-octonia	Tip Bur
Kings	114	284	0.62	0.0	0.04	2.01	0.03	5.8	0-S1	0	0-S1	0
Prince	247	913	0.58	0.0	0.02	2.50	1.8	4.1	0-S1	0	0-S1	0
Queens	75	287	0.52	0.0	0.19	1.9	0.7	4.9	0-S1	0	0-S1	0
Averages	436	1484	0.58	0.0	0.06	2.2	1.1	4.7	0-S1	0	0-S1	0

Early blight, Absent in majority, slight in many, moderate to severe in very few.

Late blight, Absent throughout.

Rhizoctonia, Absent in majority, slight in many, severe in very few.

Tip burn, Absent throughout.

NEW BRUNSWICK

	No.	Acres	Black-leg	Curly Dwarf	Leaf Roll	Mosaic	Wilts	Misses	Early Blight	Late Blight	Rhizoctonia	Tip Burn
Carleton	63	296	0.9	0.0	3.5	2.8	0.09	6.9	Sl-M	0	Sl-M	0
Gloucester	30	76	0.8	0.0	0.5	10.8	0.2	0.8	0-M	0-Sl	0-Sl	0
Madawaska	6	17	0.05	0.0	0.0	18.7	0.0	0.0	0	0	0	0
Restigouche	62	147	1.1	0.0	0.0	0.2	0.0	7.3	0-Sl	0-M	Sl	0
Victoria	60	425	0.24	0.0	1.07	4.01	0.0	0.0	0	0-M	0-M	0
Westmoreland	59	130	0.6	0.0	2.6	3.6	0.0	4.8	0-M	0	0-M	0
York	22	73	0.1	0.0	0.03	4.03	0.0	3.2	0-M	0-Sl	0-M	0
Averages	302	1164	0.66	0.0	1.04	3.87	0.04	4.1	0-M	0-Sl	0-M	0

Early blight, - Absent in most, slight to moderate in many, severe in very few.

Late blight, - Absent in large majority, slight to moderate in several.

Rhizoctonia, - Absent in many, slight to moderate in most, severe in very few.

Tip burn, - Absent throughout.

QUEBEC

	No.	Acres	Black-leg	Curly Dwarf	Leaf Roll	Mosaic	Wilts	Misses	Early Blight	Late Blight	Rhiz-octonia	Tip Burn.
Bagot	4	6	0.0	0.0	0.3	0.3	0.3	1.5	0-M	0	0.M	0
Bellechasse	2	5	0.0	0.0	0.3	0.3	0.0	2.8	0	0	Sl	0
Bonaventure	242	427	0.8	0.0	0.55	4.35	0.03	3.1	0-Sl	0	0-M	0-Sl
Champlain	3	5	0.3	0.0	2.6	9.6	0.0	0.0	0	0	0	0-Sl
Charlevoix	56	249	0.4	0.0	4.6	2.5	0.1	0.15	0	0-Sl	0-Sl	0
Drummond	8	10	0.04	0.0	1.3	1.05	0.04	0.7	0-Sl	0	0-Sl	0-Sl
Gaspe	49	62	0.92	0.0	0.49	1.43	0.09	0.28	0	0-Sl	0-Sv	0
Kamouraska	20	43	0.44	0.0	0.53	0.58	0.34	0.91	0-M	0	0-Sl	0-Sl
Lac St Jean	48	110	0.42	0.01	2.2	6.1	0.24	1.4	0-Sl	0-Sl	0-Sv	0-Sl
Laval	15	26	0.0	0.0	0.51	0.15	1.94	0.37	0-Sl	0	0	0-Sl
Levis	8	19	0.04	0.0	2.5	0.04	0.0	0.0	0	0	0	0-Sl
L'islet	10	22	0.39	0.0	1.2	0.97	0.37	1.6	0-Sl	0-M	0-M	0-Sl
Matane	272	1556	1.3	0.23	1.2	2.8	0.66	6.0	0-Sl	0-Sl	0-Sl	0-Sl
Megantic	18	12	0.06	0.0	0.68	0.07	0.6	3.55	0-Sl	0	0-Sl	0
Montmagny	16	18	0.47	0.0	1.04	2.8	0.5	1.1	0-Sl	0	0-M	0-Sl
Quebec	1	¼	0.0	0.0	0.6	1.3	0.0	1.3	Sl	0	0	0
Rimouski	235	893	0.75	0.02	0.55	3.9	0.03	7.5	0-M	0	0-M	0-Sl
Temiscouata	180	495	0.49	0.01	0.41	4.4	0.13	6.7	0-M	0	0-Sv	0-M
Terrebonne	8	28	0.0	0.0	0.77	0.2	0.77	0.08	0	0	0-Sl	0
Averages	1195	3986	0.72	0.06	0.96	3.48	0.25	4.67	0-Sl	0-Sl	0-Sv	0-Sl

Early blight, - Absent in most, slight to moderate in few and severe in very few.
Late blight, - Absent in most, slight in few, and moderate to severe in very few.
Rhizoctonia, - Absent in about half, slight in many, moderate to severe in several.
Tip burn, - Absent in most, slight to moderate in several, severe in none.

ONTARIO (Summary)

No.	Acres	Black-leg	Curly Dwarf	Leaf Roll	Mosaic	Wilts	Misses	Early Blight	Late Blight	Rhizoctonia	Tip Burn
872	1319	0.27	0.01	0.73	3.16	0.1	5.03	0.M	0	0-M	0-M

Early blight, - Absent in about half, slight in large number, moderate to severe in several.

Late blight, - Absent throughout, except slight in very few.

Rhizoctonia, - Absent in many, slight in large number, moderate to severe in many.

Tip burn, - Absent in many, slight in large number, moderate to severe in many.

ONTARIO (E)

	No.	Acres	Black-leg	Curly Dwarf	Leaf Roll	Mosaic	Wilts	Misses	Early Blight	Late Blight	Rhiz-octonia	Tip burn
Russell	1	1	0.0	0.0	2.60	0.0	0.0	0.60	0	0	Sl	0
Durham	13	24	0.0	0.0	4.97	3.03	0.0	4.01	0-Sl	0	0-Sv	0-Sl
Ontario	9	35	0.04	0.0	0.92	2.25	0.0	14.25	0-Sl	0	0-M	Sl-M
Hastings	26	20	0.0	0.03	1.60	0.98	0.0	3.70	0-Sl	0	0-M	0-Sl
Carleton	10	10	0.0	0.0	2.01	1.80	0.0	4.20	0	0	0-M	0
Peterboro-	7	6	0.0	0.0	3.90	3.20	0.0	0.60	0	0	0-Sv	0
Averages	66	96	.005	0.01	2.51	1.91	0.0	4.89	0-Sl	0	0-M	0-M

Early blight,- Absent in most, slight in some.

Late blight,- Absent throughout.

Rhizoctonia,- Absent in some, slight in many, moderate in few.

Tip burn,- Absent in some, slight in many, moderate in few.

ONTARIO (W & S)

	No.	Acres	Black-leg.	Curly Dwarf	Leaf Roll	Mosaic	Wilts	Misses	Early Blight	Late Blight	Rhiz-octonia	Tip Burn
Grey	18	19	0.0	0.0	0.6	4.7	0.0	5.9	0	0	0.-M	0-M
Wellington	2	29	0.0	0.0	1.1	1.1	0.0	4.6	0	0,	Sl	S
Bruce	29	98	0.0	0.0	1.3	4.0	0.0	7.9	0-Sl	0	0-M	0-M
Simcoe	17	61	0.0	0.0	1.7	6.6	0.0	4.1	0	0	0-Sl	0-M
Elgin	7	11	0.0	0.0	1.8	0.6	0.0	4.3	0-M	0	0-Sl	Sl-S
Huron	2	2	0.0	0.0	1.1	0.2	0.0	2.3	Sl	0	Sl	0-M
York	16	38	0.2	0.0	1.5	6.1	0.1	6.2	0-Sl	0	Sl-M	0-M
Halton	13	12	0.0	0.03	0.6	1.0	0.0	10.4	0-M	0-Sl	0-Sv	0-M
Wentworth	19	19	0.0	0.0	0.4	2.2	0.0	11.1	0-M	0	Sl-Sv	0-S
Welland	18	22	1.04	0.05	0.7	0.5	0.0	6.4	0-Sl	0	Sl-Sv	0-S
Norfolk	33	57	0.0	0.0	0.7	0.2	0.0	8.8	0-Sl	0	0-M	0-M
Brant	1	1	0.0	0.0	1.0	4.0	0.0	1.3	Sl	0	0	M
Middlesex	25	68	0.1	0.0	3.95	5.5	0.36	6.9	0-M	0	0-Sl	0-Sv
Kent	3	83	0.0	0.0	0.66	0.11	0.0	18.2	0-Sl	0	0-M	Sl-M
Averages	203	520	0.12	0.006	0.9	2.5	0.05	7.53	0-M	0	0-M	0-Sv

Early blight, - Absent in most, slight in some, and moderate in few.
Late blight,- Absent throughout (inspections made early).
Rhizoctonia,- Absent in some, slight and moderate in most, severe in few.
Tip burn,- Absent in many, slight and moderate in many, severe in few.

ONTARIO (N)

	No.	Acres	Black-leg	Curly Dwarf	Leaf Roll	Mosaic	Wilts	Misses	Early Blight	Late Blight	Rhiz-octonia	Ti Bu
Muskoka	63	34	0.04	0.0	0.44	3.21	0.00	1.30	0	0	Sl	0-S
Parry Sound	138	116	0.06	0.0	1.58	5.98	0.00	4.31	0-M	0	0-M	0-S
Nipissing	23	46	0.04	0.0	0.00	3.25	0.04	7.98	0-Sl	0	0-Sl	0-S
Temiskaming	59	47	1.13	0.0	0.90	6.54	0.32	6.02	0-Sv	0	0-Sv	0-S
Sudbury	15	60	0.71	0.0	0.04	0.95	0.29	5.35	Sl-M	0-Sv	0-M	0-M
Algoma	80	83	0.02	0.0	0.08	1.09	0.00	8.75	0-M	0	0-M	0-S
Thunder Bay	98	200	0.50	0.03	0.11	3.68	0.11	1.15	Sl	0	Sl-M	0-S
Rainy River	48	48	0.22	0.0	0.06	1.54	0.27	3.02	0-Sl	0	0-Sv	Sl-M
Kenora	79	75	0.79	0.03	0.19	1.17	0.32	5.96	0-Sl	0	0-Sv	0-M
Averages	603	703	0.35	0.01	0.48	3.52	0.12	4.52	0-M	0	0-Sv	0-S

Early blight, - Absent or slight in majority, moderate and severe in a few.

Late blight, - Practically absent throughout, except slight to severe in Sudbury.

Rhizoctonia, - Absent in many, slight to moderate in majority and severe in a few

Tip burn,- Absent in about half, slight in many and moderate or severe in several.

WESTERN PROVINCES

	No.	Acres	Black-leg	Curly Dwarf	Leaf Roll	Mosaic	Wilts	Misses	Early Blight	Late Blight	Rhiz-octonia	Tip Bur
Manitoba	716	1034	0.37	0.03	1.7	0.7	0.9	2.8	0-Sl	0	Sl-Sv	0-S
Saskatchewan	114	622	1.5	0.23	0.8	2.6	0.2	2.7	0-Sl	0	Sl-Sv	0-M
Alberta	90	178	0.74	0.04	0.1	1.8	0.35	0.44	0-Sl	0	Sl-Sv	0
British Columbia	41	133	0.8	0.1	3.5	1.2	0.24	0.0	0	0	Sl-M	0

Manitoba- Early blight,- Absent in majority, slight to moderate in many.
Late blight,- Absent throughout.
Rhizoctonia,- Absent in very few, slight in majority and moderate to severe in great many.
Tip burn,- Absent in majority, slight in many, moderate to severe in few.

Saskatchewan- Early blight,- Absent in most, slight to moderate in a few.
Late blight,- Absent throughout.
Rhizoctonia,- Absent in none, evenly divided between slight, moderate and severe.
Tip burn,- Absent in most, slight in many, moderate in few.

Alberta- Early blight,- Absent throughout.
Late blight,- Absent throughout.
Rhizoctonia,- Slight in many, moderate to severe in majority.
Tip burn,- Absent throughout, except slight in very few.

British Columbia,- Early blight- Absent throughout.
Late blight,- Absent throughout.
Rhizoctonia,- Slight in many, moderate in majority.
Tip burn,- Absent throughout.

NOTES ON POTATO DISEASES.

Late blight, caused by Phytophthora infestans.

Ontario-

Found in a few fields in Frontenac County, not prevalent.

Manitoba-

Has not been found in Manitoba.

Saskatchewan and Alberta-

Not reported in Saskatchewan or Alberta. The writer has never observed this disease in the prairie provinces of western Canada.

British Columbia-

The only areas where this disease occurred were the Chilliwack Valley and the Delta. In the former area in one case tuber infection to the extent of 50% occurred but more commonly it was from 5% to 20%.

Early blight, caused by Alternaria solani.

Manitoba-

This disease was quite common in 1921; but appeared late. It hastened somewhat the maturing of the plants.

Saskatchewan and Alberta-

Quite severe in Saskatchewan and Alberta, and caused considerable loss. "Early blight was worse than in the last four years in the Edmonton district." (Sanford).

British Columbia-

Did a certain amount of damage in the northern sections of Vancouver Island.

Leaf roll, cause unknown.

Manitoba-

Much rolling of leaves was found in fields in all parts; but especially in the drier South-west; usually it was attributed to the hot, dry conditions. Throughout the Province, true leaf roll was present in many fields; but seldom to an extent of more than two or three percent.

Saskatchewan and Alberta-

In Alberta leaf roll was reported as scarce.

British Columbia-

Leaf roll occurs but is not usually noticeable. Small plots have been found showing over 25% but the highest record obtained during certified seed inspection was about 6½% (Netted Gem at Sooke V.I.).

Mosaic, cause unknown.

Manitoba-

Like leaf roll, generally distributed; but usually in small percentages. In a few fields, a rather large percentage of plants showed decided symptoms. In other fields, especially of such varieties as Wee MacGregor, the foliage almost uniformly suggested mosaic; but no well-marked examples occurred.

Saskatchewan and Alberta-

This disease was reported as rather severe in many places in Alberta by Holmes. Other reports from Edmonton and Lacombe state that it was not very common, Mr. Greaney reports about 9% in some fields in Saskatchewan.

British Columbia-

Rather widely distributed but rarely more than 2% in fields grown for certified seed. In other cases as high as 50% or more has been observed.

Rhizoctonia, caused by Corticium vagum-solani.

Manitoba-

Rhizoctonia was very prevalent. It is responsible for many misses, and black scurf is exceedingly common on potatoes in the Red River Valley. Rhizoctonia is one of the most trouble-some potato diseases. Found as lesions on the stems in practically all crops, on a large percentage of the plants usually. New and old land, treated (formalin) and untreated seed, and all localities were affected, seemingly without much advantage in favor of one over another. Comparatively few crops seemed to have suffered much from its presence, either in stand or as indicated by symptoms on the growing plant. "Little potatoes" above ground were abundant on one crop, in a very wet portion of the

field only. The occurrence of the sclerotia on the harvested tubers varied from practically none to well over 75 percent of the tubers; but it is my opinion that absence of sclerotia coincided generally with immaturity when dug or killed by frost.

Saskatchewan and Alberta-

Rhizoctonia was as usual very severe. This is the most serious disease of potatoes in Western Canada, and causes much reduction in yield.

Blackleg, caused by Bacillus Phytophthorus.

Manitoba-

Irregularly present, and usually only in small percentage. Wetter parts of fields were found worse affected in one or two localities. Not serious.

Saskatchewan and Alberta-

This bacterial disease was present, but not severe in Saskatchewan. Mr. Greaney reported about 2% in the fields inspected. In the Edmonton district this disease was much more severe.

Wilt, caused by Fusarium.

Manitoba-

Common but the losses were not large. Typical wilting was rather uncommonly noticed except by one inspector, although a slight browning of the vascular layer of the stems, without wilting of the tops, was not infrequent. In some fields, an unthrifty appearance of the upper part of the plant, due to rolling, and a purplish cast of the foliage was noticed on numbers of plants.

Saskatchewan and Alberta-

There were no reports on Fusarium wilt. It occurs, but is not common.

British Columbia-

Generally distributed and affecting 1% to 5% of the plants, occasionally more.

Tip burn.

Manitoba-

This was quite abundant late in the season. Leaf hoppers evidently induced most of this trouble and became quite abundant.

Scab, caused by Actinomyces chromogenus.

Manitoba-

Found especially abundant this year. Presence quite variable. Perhaps somewhat more frequently serious on the lighter soils and on the Cobbler variety. A deep or pitted type was plentiful in one crop grown from Minnesota seed; while the adjoining crop from local seed of the same variety, Cobbler, was free. In another locality, a few specimens of what may have been Oospora pustulans were found.

Saskatchewan and Alberta-

As usual very common.

Minor diseases of potatoes.

Powdery scab (Spongospora subterranea). "Powdery scab existed at least three years on two plots in Edmonton, Alta., badly scabbing the potatoes.

It has not spread to my knowledge." (Sanford). This is the only report of Powdery scab.

Powdery scab in British Columbia is practically confined to the Lower Fraser Valley and rarely more than 2% of the tubers are affected.

Curly dwarf (cause unknown). Occasionally found in Manitoba.

Armillaria mellea(?)...In acrop grown on new land in northern Manitoba, several tubers were found bearing strands similar to those illustrated in Bisby and Tolaas' bulletin, Potato Diseases in Minnesota.

Dry Rot (caused by Fusarium discolor sulphureum and other Fusaria) developed during storage last winter in Manitoba, and caused probably, a considerable loss of stored potatoes.

Net necrosis, etc. A variety of internal netting browning etc. in the vascular layer of the stem end and usually reaching very slightly away from the stem attachment are found in Manitoba. In only one crop was netting very pronounced and general. In some Early Ohios, the tendency to red streaking and blotching in the flesh is strong.

"Bronzing." Under this term may be reported a trouble which occurred on several farms in the Dauphin district of Manitoba, mostly on long-cropped rather light soils; but in one case a newly-broken, almost peaty, soil in

a slight hollow. Where worst, the yield was seriously reduced on all but certain clearly-marked areas scattered through the fields, probably representing burned straw piles, where the vines remained green. The main crop first became bronzed or purplish and later brown and reduced in size and died prematurely. The suggestion is offered that the trouble is a form of "potash hunger." A full report on its occurrence, the symptoms and the cultural and other conditions was made, and samples of the soil were submitted to the Division of Botany, Ottawa.

Arsenical injury. Occasional in Manitoba. In one field where some plants were actually girdled at the surface of the ground and many others less severely injured; the Paris Green could be recognized by its color in the soil.

TOMATO.

Blossom end rot caused by fluctuating water supply.

Manitoba-

This disease was very common again this year and is the worst tomato disease. Other diseases of tomato seemed practically absent.

Saskatchewan and Alberta-

Present in a few gardens in Saskatchewan.

Buck-eye rot, caused by Phytophthora terrestria.

British Columbia-

This disease was found to be causing a slight amount of loss in a green-house at Victoria.

Mosaic, infectious but cause undetermined.

Prince Edward Island-

This trouble was found to a moderate extent. Average occurrence about 3.5%.

Ontario-

Common in the Niagara peninsula.

TURNIP

Club root, caused by Plasmodiophora brassicae

Nova Scotia-

Numerous cases reported, infection varying from 1 to 7%. In one case in King's County, however, 45% of the crop was affected.

Prince Edward Island-

This disease was observed in slight to moderate amounts in different parts of the province.

SURVEY OF THE PREVALENCE OF PLANT DISEASES IN THE DOMINION OF CANADA.

1922

THIRD ANNUAL REPORT

DIVISION OF BOTANY
EXPERIMENTAL FARMS BRANCH
DEPARTMENT OF AGRICULTURE

I N T R O D U C T I O N.

The following is a report on the prevalence of plant diseases during the year 1922.

The success of this survey is due to the splendid reports which have been received from the following collaborators:-

British Columbia	J.W.Eastham, Provincial Plant Pathologist (Coast and Kootenay Districts). H.R.McLarty, Officer in Charge Dominion Field Laboratory of Plant Pathology (Okanagan Valley and Salmon Arm). A.T.Davidson, Plant Disease Inspector.
Alberta	G.E.Delong, Dominion Experimental Farm, Lacombe. H.S.McLeod, District Plant Disease Inspector.
Saskatchewan	W.P.Fraser, Officer in charge Dominion Field Laboratory of Plant Pathology, Saskatoon. P.M.Simmonds, Assistant Plant Pathologist. J.H. Craigie, C.E.Maguire, J.W.Scannell, F.J.Greaney, C.H.Holmes, Plant Disease Inspectors.

Manitoba	V.W.Jackson, Professor of Botany, Manitoba Agricultural College.
	H. Groh, District Plant Disease Inspector.
Ontario.	H.T.Güssow, Dominion Botanist, Central Experimental Farm, Ottawa.
	Dr. J.H.Faull, Professor of Botany, University of Toronto.
	J.E.Howitt, Professor of Botany, Ontario Agricultural College.
	Dr. R.E.Stone, Ontario Agricultural College.
	A.W.McCallum, Forest Pathologist, Central Experimental Farm, Ottawa.
	J.F.Hockey, Assistant Plant Pathologist, St. Catharines.
	G. Partridge, Chief Plant Disease Inspector, Ottawa.
	J. Tucker, District Plant Disease Inspector.
Quebec.	Dr. B.T.Dickson, Professor of Botany, Macdonald College.
	J.G.Coulson, Macdonald College.
New Brunswick	G.C.Cunningham, Officer in Charge Dominion Field Laboratory of Plant Pathology, Fredericton.
	A.A.Brown, District Plant Disease Inspector.

Nova Scotia	(A. Kelsall, Entomologist Annapolis (Royal (W.K.McCulloch, District Plant Disease (Inspector. (S.C.Partridge, Plant Disease Inspector.
Prince Edward Island	(J. B. MacCurry, Officer in Charge (Dominion Field Laboratory of Plant (Pathology, Charlottetown. (G.O.Madden, Assistant Plant Pathologist (S.G.Keppin, District Plant Disease (Inspector.

F. L. DRAYTON

Plant Pathologist, Ottawa.

CEREAL DISEASES

WHEAT

STEM RUST, caused by Puccinia graminis Pers.

Alberta-

Owing to the dry weather the cereals ripened prematurely, and this prevented many of the plant diseases attaining any serious proportions (DeLong). The weather was very dry in Central and Northern Alberta during the season, and plant diseases were even less than usual. Very little rust was observed on early sown grain. On very late grain a few pustules were present. Collections were made on very late seeded wheat at Edmonton and Vermilion. A little rust was present on heavily irrigated plots at Lethbridge. None could be found on very late seeded wheat at Lacombe.

Saskatchewan-

Stem rust was first found on barberry on May 30th near Saskatoon; the pycnia were advanced and the aecia about opening at Indian Head on June 1. Heavy infection was present at Outlook on June 12th. The aecia had been shedding spores for some time. Collections were made at Melville, Sask., on July 12th. It was general by the 18th in Southern Saskatchewan. In the first week of August collections were first made at Saskatoon and Rosthern, and rust was general in Northern Saskatchewan, though only a few pustules here and there in each field by the second week. Late in the season rust was present at

Edmonton on very late wheat, but the main crop showed no rust. There was a considerable development of rust in Southern Saskatchewan, but little injury was done by stem rust this season. This was probably due to the dry weather that prevailed in July. Not since 1915 has wheat been less injured by rust in Western Canada.

Manitoba-

Pycnia were observed on our Agricultural College's five barberry shrubs on May 15, and open aecia on May 18, or about two weeks earlier than last year. Wheat was sown adjoining these shrubs on May 1. It burst shot blades on June 15, and showed rust spots on June 25. This rust developed rapidly within a 30 yard radius of the barberry bushes, and had reached the black spore stage by July 5. This wheat plot extended for 200 yards; but the rust did not spread more than 50 yards for some time, and until there was a general infection throughout the province. On July 12 a survey of rust on the college farm was made as follows:-

	Per Cent Infected		
From Barberry	Leaves	Stem	Heads
30 ft.	100	100	100
200 yds.	100	-	-
¼ mile	20	-	-
500 yds.	20	-	-
600 yds.	22	-	-
700 yds.	5	-	-
750 yds.	15	-	-
1000 yds.	trace	-	-
¾ mile	10	-	-

From here on the infection varies with variety from 5-15%. Beyond the ½ mile the infection is mostly leaf rust. Black stage not visible except in plots adjacent to Barberry.

It was obvious that the rust on the far fields of the farm had not come from the barberry infection centre, as distant fields and other parts of the province had rust as early and as bad as the college plots.

The stem rust was very irregular this year throughout the province, and it would be difficult to account for the severity in some parts and absence in other parts (V. W. Jackson).

Stem rust on wheat was first reported in Western Canada by H. Groh from Manitoba Agricultural College, collected on July 10th. A collection was made on the same date at Morden by W. E. Lake. The latter collection showed secondary infection, so that it must have been present for some days.

Ontario-

Grey County: Comparatively little.

Grenville County: Farmers in this district have variously estimated the loss from stem rust from 25 to 50%. Possibly 25% would be a conservative estimate.

Haldimand County: While present in all parts of the county, was not sufficiently severe to do a great deal of damage.

Wellington County: Grain rusts were not as bad as usual this year.

Port Arthur: Grains were quite seriously affected with stem rust.

Gore Bay: Stem rust was very serious on late grains this year, with a loss estimated at 35%.

Emo: The loss is estimated at 30%.

New Brunswick-
This disease occurs quite generally in New Brunswick. All of the eight fields examined showed its presence. It did not appear to be so active or abundant in 1921 and 1922 as in previous seasons, possibly on account of the dry summers. Losses not estimated.

Prince Edward Island-
Prevalent to a greater extent than last year, and in many cases the crop was severely attacked. Generally speaking, the most severe infection occurred on the most vigorous growth.

LEAF RUST, caused by Puccinia triticina Eriks.

Alberta-
Trace present at Lacombe (DeLong). Not collected elsewhere.

Saskatchewan-
Generally present, but not abundant as in 1921. The first collection was made on June 20th at Manitoba Agricultural College.

Manitoba-
Not nearly so prevalent as in 1921. Although present from July 1st, it did not seem to develop as one would expect from the wet July we had, and the effect on the crop was perhaps very slight.

Ontario-

This disease has caused little or no damage to the wheat this year.

Prince Edward Island-

Very prevalent on both leaves and sheaths, though more abundant on the former.

STINKING SMUT, caused by Tilletia laevis Kuhn and Tilletia tritici (Bjerk) Wint.

Saskatchewan-

Not usually present in best farming sections. One large field near Saskatoon showed 15% infection.

Manitoba-

Developed in 237 heads per fortieth of an acre in untreated check plots from "tagged" seed. This was the worst we have had it in seven years, perhaps because conditions were more favourable (sown Apr.28, on new ground). As Formaldehyde is generally used throughout the province, very little bunt is noticeable, however.

Ontario-

Waterloo County: This disease caused a loss of 3%.

Grenville County: No serious complaint has been made of this disease.

Haldimand County: It is always present, but not so prevalent this year as in the past. The loss is estimated at 5%.

Wentworth County: It is noted among the diseases most prominent in this county, causing thousands of dollar's worth of loss.

Northern Ontario: No appearance of serious damage having been incurred.

Quebec-
Found in isolated cases, but not causing as serious losses as the loose smut.

New Brunswick-
Found in five of the eight fields examined. Only a few heads in each case. It has been observed to the extent of 1% in previous years.

Prince Edward Island-
Very little of this disease observed this year.

LOOSE SMUT, caused by Ustilago tritici (Pers.) Rostr.

Saskatchewan-
General in occurrence but not more than 1 to 5% in places which came under observation.

Manitoba-
Was more prevalent this year, as were all the smuts on our "Bunt" control plots. Smut averaged 84 heads to the fortieth of an acre or 3360 per acre (June 28.) The other college wheat and fields inspected throughout the province seemed equally infected, and would warrant the use of hot water treatment, especially for barley, which was very badly infected with loose smut this year.

Ontario-
No appreciable damage was observed due to this disease.

Quebec-
Quite serious, and doing much more damage than the stinking smut.

New Brunswick-
Present in the eight fields examined, varying from a few

heads to 3%, average about ½ of 1%. Has frequently been noted during past years on the Experimental Farm, Fredericton.

Prince Edward Island-
General, infection averaging from slight to 4.7%. Average of fall fields examined would be about 2%.

SCAB, caused by Gibberella saubinetii (Mont) Sacc.

Saskatchewan-
Collections were made at Tisdale. Not generally present.

Manitoba-
A few diseased plants collected at Winnipeg. A Fusarium was found causing damage to wheat at Treesbank. It probably belonged to this species.

New Brunswick-
Quite common on wheat during the last two seasons; not so pronounced in 1922 as in 1920-21. It promises to be an important disease. It has also been noted on Barley in the test plot at the Experimental Station, Fredericton.

Prince Edward Island-
Found in the three counties this year, being more general than last year, with correspondingly higher infection due to more favourable weather conditions for its development. Average infection 2.3%.

GLUME SPOT, caused by Septoria nodorum Berk.

Alberta-

Trace only (DeLong).

Saskatchewan-

Not much observed. Collections were made in Southern Saskatchewan.

New Brunswick-

Has been noted in every wheat field examined since 1918, occurring on all parts of the plant above ground. It is believed to be one of the chief causes of poor crops. In many cases it does not become apparent until the plants are maturing. Dawson's Golden Chaff, a fall variety, at least shows resistance, if not immunity. No treatments so far tried have given promising results.

GLUME ROT, caused by Bacterium atrofaciens McCulloch

Alberta-

Collections made at Lloydminster; not common.

Saskatchewan-

Not severe in any locality surveyed, though collections were made at various places.

Manitoba-

Collections were made at Winnipeg; not common.

ERGOT, caused by Claviceps purpurea (Fr.) Tul.

Saskatchewan-

Collected on Durum wheat in Southern Saskatchewan. Not common.

Manitoba-

A few collections were made on wheat.

New Brunswick-

Does not occur generally. Found three infected heads in one field near Sackville. The disease is probably of minor importance.

KRINKLE JOINT: cause unknown

Alberta-

About 10% of affected plants were present in some plots at the Dominion Experimental Station at Lacombe. Present also in surrounding districts (DeLong).

Saskatchewan-

This is marked by a kink or abrupt bend on the lower internodes of the stem. As the plants become old the stem breaks at this point and the plant falls over. It was found most severe in the variety Major.

POWDERY MILDEW, caused by Erysiphe graminis DC.

Saskatchewan-

This was prominent in plots at Rosthern.

Prince Edward Island-

Several heavy infections observed. Not general.

HEAD BLIGHT and STEM ROT,
caused by Helminthosporium sativum (P) K. & B.

Saskatchewan-

A Helminthosporium was common on the stems and heads of wheat, causing blight of heads and rot of the base of the stems. The spores closely resemble H. sativum. It was common and severe on Durum wheats.

OATS

STEM RUST, caused by Puccinia graminis Pers.

Saskatchewan-

Distribution similar to stem rust of wheat; appearing in some places before wheat stem rust. The stem rust was very severe on late oats in Southern Saskatchewan, and must have lessened the yield to a considerable extent.

Manitoba-

Very severe on late oats in Southern Manitoba. Appeared early at Brandon.

Ontario-

Waterloo County: Responsible for a loss of about 15%.

Grenville County: A loss of 10% would be a conservative estimate.

Frontenac County: Quite prevalent on late sown grain that had lodged.

Haldimand County: Present in all parts of the county, but not sufficiently severe to do a great deal of damage.

Lanark County: The percentage of fields affected is quite high. Some fields of late oats were so badly affected that not over 5% of the plants headed, and it had to be cut green for feed.

Wentworth County: This was among the most prominent diseases this year.

Northern Ontario: Quite serious, with losses estimated from 15 to 20%.

New Brunswick-

Present in most fields and developing more severely late in the season; early observations not positive.

Prince Edward Island-

General throughout the province and often severe.

LEAF RUST or CROWN RUST, caused by Puccinia coronata Cda.

Saskatchewan-

The aecial stage of this rust was very severe on Rhamnus cathartica in Southern Saskatchewan in early summer. It was so abundant that the buckthorns appeared yellow at some distance. It was present, but less severe, in the northern part of the province. The crown rust was very severe in Southern Saskatchewan and extended northward as far at least as Saskatoon, but not nearly so severe as in the south.

Manitoba-

Very severe on late oats in Southern Manitoba.

Ontario-

Grey County: Prevalent, though no serious loss incurred.

Huron County: This has been by far the most destructive disease this year. While its ravages cannot be said to have been general, yet in quite a few cases we have had bad attacks of this disease. In the vicinity of Belgrave two or three farmers have had their oat crops injured to the extent of about 50%. In this locality we found a good many buckthorn hedges. Two or three miles from the locality where the buckthorn hedges were, oats were as fine a crop as you could expect to see.

Brant County: A number of farmers in this district report that oats which should have yielded from forty to fifty bushels per acre are only yielding from eighteen to twenty bushels. This must be due entirely to the rust of grain. Farmers agree that leaf rust of oats is largely responsible for this decreased yield.

Waterloo County: Damage done to the extent of about 15%.

Lampton County: Late sown oats as usual have suffered considerably.

Frontenac County: Quite prevalent on late sown oats which had lodged. The damage amounted to about 5%.

Durham County: Rusts have been particularly bad this year in oats, especially the Leaf Rust. Some very promising fields filled so poorly that they were not worth thrashing. I would estimate that the damage done by this disease throughout, was at least 10%, and I am putting it low.

Haldimand County: This disease has been very bad during the past season. There is one section of the county where the oat crop was practically a total failure due to this disease. I may state that there is a Buckthorn hedge on one of these farms, and for a distance of about three miles in each direction the oat crop is practically a total loss. When the oat crop in this district started to ripen it was so badly affected with rust that it simply wilted down and the grain did not fill up. While this section is of course very exceptional, I would estimate that the loss due to this disease for the entire county is between 15 and 20%.

Wellington County: Not so bad as usual this year.

Lanark County: 75% of the oats were affected with leaf rust to a greater or lesser extent.

York County: There was considerable leaf rust this year.

Wentworth County: This disease has caused thousands of dollars worth of loss throughout this county this year. Many fields of oats which gave promise of good crops turned out very poorly on account of leaf rust.

Oxford County: This is the only disease which has done appreciable damage in this county this year.

This damage has been observed chiefly in sections in which Buckthorn hedges are growing. In the areas examined I would estimate the damage done by this disease at not less than 5% of the total crop.

Port Arthur: The loss on account of leaf rust is about 3%.

Dryden: Quite severe.

Emo: Very little damage has been done this year.

Prince Edward Island-
General, but apparently causing little damage.

SMUT, caused by Ustilago avenae (Pers.) Jens. and Ustilago levis (K.&S.) Magn.

Alberta-
Considerable present in S. Alberta varying from 1 to 10%.

Saskatchewan-
Covered smut common, but not generally above 5%, usually much less. Loose smut not much observed.

Manitoba-
Covered smut present. No data as to percentage available.

Ontario-
Wellington County: The result of six surveys in which actual counts were made in this county, which is fairly representative for the whole Province of Ontario, showed t at the amount of oat smut present in the fields averaged 3.%

Grey County: In some fields this disease was as high as 10%.

Frontenac County: The loose smut of oats has caused from 5 to 20% loss, the higher amounts only occurring in a few cases.

Haldimand County: Loss from this disease was very small.

Lanark County: The amount of smut present this year was the smallest in the history of the county. I do not think there would be over 2% of smut present. Large numbers of fields were entirely free from this trouble.

Wentworth County: This was one of the prominent diseases in the county this year.

Port Arthur: The loose smut of oats has caused more loss here this year than it has ever done before in the district, some fields being fully 50% smut, while there were very few fields indeed that were not slightly affected. The loss from this disease would probably average about 15% of the oat crop.

Dryden: A great deal of loss has been caused this year by loose smut of oats; on an average I think this loss would amount to 20% and in some cases run as high as 40%.

Gone Bay: This disease is quite common and generally distributed.

Emo: There has been very little damage this year.

New Brunswick-

Loose smut is present in all sections of the province.

Twenty-five fields examined showed from 2% to 10%.

The average was 4½% infected. No field was found free from it. A higher count would probably have been obtained if careful record had been made on the same fields throughout the season.

Covered smut was not recorded in any of the fields.

Prince Edward Island-

Very common, and severe in exceptional cases, where infection ranged as high as 21%. Average of all reports, however, was 4.1%.

HALO BLIGHT, caused by Bacterium coronafaciens Elliot

Saskatchewan-
Common and quite severe in some fields.

SCAB, caused by Gibberella Saubinetii (Mont.) Sacc.

New Brunswick-
This disease was first noted as being of importance in fields on the Experimental Farm, Fredericton, in 1920, where as high as 5% of the heads were infected. It was observed in five fields out of twenty-five examined in 1922, averaging about ½ to 1%. Not recorded as serious.

BARLEY

STEM RUST, caused by Puccinia graminis Pers.

Alberta-
Small amount present in North-eastern Alberta. None collected in Edmonton, Lacombe or Lethbridge districts.

Saskatchewan-
Common on barley, but not doing much damage. Distribution generally the same as the stem rust of wheat

Manitoba-
General, but not causing much damage.

Ontario-
Port Arthur; Very slight. Not more than 20%.

Prince Edward Island-
Very common throughout the province; while infection was usually slight to moderate, several severe cases observed.

SMUT, caused by Ustilago nuda (Jens.) K. & S.
and Ustilago Hordei (Pers.) K. & S.

Alberta-
Present. Collections made at Raymond and Vermilion.

Saskatchewan-
Covered smut present, varying amount; generally only a small percentage present, but in some fields five to ten per cent.

Loose smut observed, but not much. One field at Rosthern showed about ten per cent.

Ontario-
Frontenac County: Loose smut has been noticed in a few cases, but the damage did not exceed 5%.

Haldimand County: Loose smut present, though I am unable to estimate the loss.

Prince Edward Island-
Loose smut was fairly general where barley was grown, infection averaging about 5.2%.

STRIPE DISEASE, caused by Pleospora gramineum Diet.

Alberta-
About one per cent present (DeLong).

Saskatchewan-
General in occurrence and quite severe in some localities.

Manitoba-
General, quite severe in some localities.

Prince Edward Island-
Generally present, though usually only to a slight extent.

NET BLOTCH, caused by Helminthosporium teres Sacc.

Alberta-
About 2% present.

Saskatchewan-
Not common; collections were made at several places.

Manitoba-
Present, but not severe.

Prince Edward Island-
Not observed.

LEAF SPOT or SCALD,
caused by Rhynchosporium secalis (Heins) Davis.

Alberta-
Collections were made on the plots of the University field experiments at Edmonton. It was quite severe in a few spots, but not general. This disease was present last year at Edmonton in about the same degree of severity. This is the first report in Canada of this disease which is serious in the Mississippi Valley.

RYE

LEAF RUST, caused by Puccinia dispersa E. & H.

Alberta-
Present on winter rye at Lacombe.

Saskatchewan-
Common on winter rye. General.

Manitoba-
Common on winter rye.

ERGOT, caused by Claviceps purpurea (Fr.) Tul.

Alberta -
About 3% present (DeLong).

Manitoba -
Present as usual, but not severe.

STEM RUST, caused by Puccinia graminis Pers.

Manitoba -
Present, but not severe.

FORAGE AND FIBER CROPS

ALFALFA

LEAF SPOT, caused by Pseudopeziza medicaginis (Lib.) Sacc.

British Columbia, Coast and Kootenay-
Quite common as usual, but rarely doing any serious damage.

Alberta-
About 5 to 10% present.

Prince Edward Island-
General, but not severe.

ROOT ROT or WILT, caused by Sclerotinia trifoliorum Eriks.

British Columbia, Coast and Kootenay-
No new infected areas reported.

Prince Edward Island-
Absent.

DOWNY MILDEW, caused by Peronospora trifoliorum de Bary

Prince Edward Island-
Absent.

CLOVERS

POWDERY MILDEW, caused by Erysiphe polygoni DC.

Manitoba-
Present in clover at Morden.

Eastern Canada-
Extremely prevalent this season. Reports from every

province indicate its presence being widespread. In Ontario specimens have been sent from as far north as Sudbury and Temagami. In Western Quebec Dr. Dickson says, "Present to an astonishing extent - fields of clover looking as though powdered with flour."

New Brunswick-
Practically every field or patch of clover was infected in 1922. The leaves were distinctly whitened. Its common occurrence and rapid development was due to the wet weather of June and July.

Prince Edward Island-
This disease was general throughout the province, and in many cases the leaves were severely infected.

RUST, caused by Uromyces trifolii (Pers.) Fcl.

Alberta-
Locally common.

Saskatchewan-
A collection was made at Melford. Not observed elsewhere.

Prince Edward Island-
Present to a moderate extent. Not general. In no case severe.

SOOTY SPOT, caused by Phyllachora trifolii (Pers.) Fcl.

Manitoba-
Collected at Winnipeg. Conidial stage only.

Western Quebec-
Was of frequent occurrence, but did not cause any perceptible loss.

MOSAIC, cause unknown

Western Quebec-
Was again common in certain areas.

New Brunswick-
This disease has not been observed in New Brunswick.

LEAF SPOT, caused by Pseudopeziza trifolii (Pers.) Fckl.

New Brunswick-
This fungus developed abundantly on clovers throughout New Brunswick, and undoubtedly causes considerable loss in quality and quantity.

CORN

SMUT, caused by Ustilago Zeae Schw.

Ontario-
Exceptionally prevalent in Carleton County, causing a loss varying from 2 to 10%.

Prince Edward Island-
Not observed.

RUST, caused by Puccinia sorghi Schw.

Manitoba-
Collections made at Morden. Not severe.

Prince Edward Island-
Not observed.

FLAX

RUST, caused by Melampsora Lini DC.

Saskatchewan-
Not commonly observed. A few collections made.

Ontario-
Quite common on the experimental plots at the Central Experimental Farm at Ottawa, causing considerable loss in the fiber qualities of some plots.

Prince Edward Island-
Slight infection observed.

WILT, caused by Fusarium Lini Bolley.

Saskatchewan-
Not general. Very severe in some fields in the southern part of the province.

GRASSES

STEM RUST, caused by Puccinia graminis Pers.

Alberta-
Collected on Hordeum jubatum at MacLeod.

Saskatchewan-
Common on susceptible grasses late in the season.

Manitoba-
Common on susceptible grasses.

ERGOT, caused by Claviceps purpurea (Fr.) Tul.

Saskatchewan-

Common on many grasses, particularly the following:

Agropyron smithii Rydb.

Spartina pectinata Bosc.

Calamagrostis americana Scrib.

Elymus macounii Vasey.

Agropyron repens (L) Beaux.

RUST, caused by Puccinia clematidis (DC.) Lagerh.

Manitoba-

Common on Agropyron tenerum Vasey, and other species of Agropyron, Bromus and Elymus.

STRIPE RUST, caused by Puccinia glumarum (Shum.) Er. and Hu.

Alberta-

Collections were made on Hordeum jubatum at MacLeod.

SMUT, caused by Ustilago Agropyri Clinton

Alberta-

Specimens of this smut were sent in from Olds by H. S. MacLeod.

MILLET

SMUT, caused by Sorosporium Syntherismae (Peck.) Farl.

Saskatchewan-
Collected on University plots at Saskatoon by Professor Kirk.

SUNFLOWER

DROP or WILT, caused by Sclerotinia sp., probably libertiana

British Columbia, Coast and Kootenay-
Found at two points in the lower Fraser Valley. Only a small percentage of plants affected.

Okanagan and Salmon Arm-
A slight infection on the Experimental Station, Summerland.

Manitoba-
Present at Winnipeg, but not common.

Quebec-
Samples of sunflower stems suffering from Sclerotinia rot and wilt were sent in from all parts of Quebec, indicating its widespread occurrence. It has been impossible to ascertain the infection percentage.

Ontario-
A very heavy infection in the sunflowers for seed at the Central Experimental Farm, Ottawa, causing the death of 45% of the plants in a two acre patch.

RUST, caused by Puccinia helianthi Schw.

Saskatchewan-

General ly present, but not doing much damage.

Manitoba-

General in Southern Manitoba, but not very severe.

Ontario-

Exceedingly common at the Central Experimental Farm, Ottawa, causing a certain amount of defoliation, but the extent of the loss is questionable.

Quebec-

Was exceedingly common (75%) during September.

POWDERY MILDEW, caused by Erysiphe cichoracearum DC.

Manitoba-

Present on experimental plots at Brandon. Not severe

BURNING of foliage

NOTICED in Vernon district and at Experimental Station, Summerland. At Summerland trouble was apparently brought about by drought.

FRUIT DISEASES

APPLE

SCAB, caused by Venturia inaequalis (Cke.) Wint.

British Columbia, Coast and Kootenay-
Owing to the abnormally dry summer, Scab was much less in evidence than usual; even unsprayed McIntosh Red at the Coast have only shown 5 to 10% infection in many cases.

Okanagan Valley and Salmon Arm-
Some Scab occurs in the Salmon Arm and Vernon districts but no losses have occurred where the ordinary sprays have been applied.

Manitoba-
Collected at Winnipeg and Morden.

Ontario-
Prevalent throughout the province. Many unsprayed or poorly sprayed orchards suffered a comparatively heavy late infection on fruit.

Quebec-
There was a heavy infection wherever spraying was not done or where orchards were poorly sprayed.

New Brunswick-
This disease is ever present, and causes a very large amount of damage every year. Spraying, while greatly reducing infection, seldom completely eliminates it. Certain varieties are more infected than others. It can always be found in any orchard on the twigs, leaves and fruit. Probably more severe in 1922 than in 1921.

Prince Edward Island-

This disease was present to a much larger extent than during the previous year, though it was well controlled by spraying. Where spraying was neglected leaf and fruit infection averaged 26% and 58% respectively.

FIRE BLIGHT, caused by Bacillus amylovorus (Burr) Trev.

British Columbia, Coast and Kootenay-

There was an increased amount of this on the West Arm of the Kootenay Lake, especially at Harrop. No new areas of infestation reported.

Okanagan Valley and Salmon Arm-

This disease was again serious in the Salmon Arm and Northern Okanagan districts. South of Kelowna the disease has been kept well in hand.

Ontario-

There was a comparatively heavy infection of twig blight on apples in various parts of the district. Little effort is made during the season to prune out diseased branches.

New Brunswick-

No records with positive diagnosis. It is not of common occurrence.

Prince Edward Island-

Very little found this year.

BLACK ROT CANKER, caused by Physalospora cydoniae Arn.

Manitoba-
Present, attacking the leaves at Morden. Not severe.

Ontario-
Present in many orchards, but no severe fruit infection.

Quebec-
While not common, was frequently found.

New Brunswick-
This is probably the most destructive fungus found in the apple orchards of New Brunswick. It is especially active in producing cankers. The almost complete destruction of some orchards is attributed to it. It has been exceptionally active following the severe winter of 1918. Leaf spots caused by it are exceptionally common and probably materially assist in the early defoliation of trees.

Prince Edward Island-
Not observed.

EUROPEAN CANKER, caused by Nectria galligena Bres.

British Columbia, Coast and Kootenay-
Has been noticed in a few trees on city lots in Vancouver, but apparently of no economic importance to the apple industry.

Prince Edward Island-
Not observed.

ANTHRACNOSE, caused by Neofabraea malicorticis (Cord) Jack.

British Columbia, Coast and Kootenay-
The usual amount was found in unsprayed orchards at the Coast, but fall spraying is now being carried out with almost complete control in commercial orchards.

Okanagan Valley and Salmon Arm-
Cankers from this cause in Salmon Arm and occasionally in the Vernon district. Infection as a rule is not severe, spraying being only advisable in certain cases.

BITTER ROT, caused by
Glomerella rufomaculans Spauld. & Von Sch.

Quebec-
Found in two orchards on Fameuse apples, but only to a slight extent.

New Brunswick-
This fungus causes considerable injury in the form of a bitter rot of the fruit and cankers on the branches. Has been noted from several sections of the province.

SOOTY BLOTCH, caused by
Gloeodes pomigena (Schw.) Colby

Ontario-
Found in occasional orchards which are poorly cared for. Northern Spy appeared to be most susceptible, with infections ranging up to 12% of the fruit.

POWDERY MILDEW, caused by
Podosphaera leucotricha (E. & E.) Salm.

British Columbia, Okanagan Valley and Salmon Arm-
Although there was a serious infection last year, this disease was this year practically absent throughout the whole district. This has been due, no doubt, to weather conditions being unfavourable for the fungus during the early part of the season.

Prince Edward Island-
Not observed.

COLLAR ROT, caused by Armillaria mellea (Vahl.) Quel.

British Columbia, Okanagan Valley and Salmon Arm-
There is throughout the whole Okanagan and Salmon Arm districts a very considerable amount of this disease. While no systematic count has been made to determine the number of trees affected, it would be safe to say that at least thousands of trees are lost throughout the whole district every year.

LEAF SPOT, caused by Phyllosticta sp.

Quebec-
In one orchard to the extent of 100%.

FRUIT SPOT, caused by Cylindrosporium pomi Brooks

New Brunswick-
This fungus is rather prevalent and causes considerable loss some seasons. In 1919 some orchardists reported 100% of the fruit infected on some trees.

BROWN ROT, caused by Sclerotinia cinerea (Bon.) Wor.

Quebec-

Was noted from many sources on Yellow Transparent and Montreal apples.

SILVER LEAF, caused by Stereum purpureum Pers.

In 1919 and 1920 this disease was very prevalent and caused considerable uneasiness among fruit men. During 1921 and 1922 many of the trees infected in previous seasons failed to show symptoms. However, the disease is present in practically every orchard, probably not exceeding 1% of the trees.

CANKER, caused by Nectria sp.

Cankers on young trees and branches of apples, particularly in the St.John Valley nursery, have been noted each year. These may follow winter killing and are attributed to Nectria cinnabarina (Tode) Fr.

PHYSIOLOGICAL DISEASES

BITTER PIT

British Columbia, Okanagan Valley and Salmon Arm-

Has occurred throughout the whole district and is more prevalent this year than last. Several carload lots have been turned down because of it.

Ontario-

Few varieties affected. Baldwins showed up to 75% infection in Lincoln County.

DROUGHT SPOT

British Columbia, Okanagan Valley and Salmon Arm-
Losses from this source have been very considerable, the disease occurring in several orchards in each district. In some orchards the loss from this cause was as high as 75%.

CORE ROT

(Note: The writer has not seen any literature giving an exact description of this trouble. It is characterized by a few corky spots in the neighbourhood of the vascular ring at the core, and by a somewhat water cored appearance inside this vascular ring. The injury occurred at some time before thinning.)

British Columbia, Okanagan Valley and Salmon Arm-
In the Salmon Arm district an exceedingly heavy loss has been incurred through this disease. Fully twenty-five thousand boxes of Wealthies and from 30 to 40% of the Jonathan and McIntosh varieties were found to be unmarketable.

WINTER INJURY

British Columbia, Okanagan Valley and Salmon Arm-
In the Salmon Arm district and occasionally in certain orchards throughout the Okanagan, there was considerable loss due to winter injury of the roots. North of Salmon Arm, the trees in a few orchards were severely injured at the crown.

CHERRY

BROWN ROT, caused by Sclerotinia cinerea (Bon.) Wor.

British Columbia, Coast and Kootenay-
Only present in Coastal area. Very little on fruit this season. Severe blossom blight on cherries, especially Olivets, at Gordon Head, Victoria, 10% to 75% of the blossoms being destroyed.

Saskatchewan-
Common on the wild chokecherries at Prince Albert and Saskatoon, causing a twig blight.

Manitoba-
Present on cherries at Morden.

Ontario-
Orchards having poor air drainage or adjacent to peach orchards showed from light to heavy blossom blight. Several reports of 100% blossom blight from such orchards. Fruit infections were more serious on varieties of sweet cherries, causing up to 75% loss. Losses in shipments ran up to 100%.

Prince Edward Island-
Little appreciable damage was caused by this disease. Affected fruits averaged about 1.5%.

LEAF BLIGHT, caused by Coccomyces sp.

Ontario-
An excellent year for comparison of the effects of spraying. Unsprayed orchards suffered from 75-100% defoliation. Sprayed orchards were only slightly attacked. An orchard was noted where one-half of

the trees had received two applications and the other half three applications of spray. The former suffered 30-40% defoliation, whereas there was practically no disease present on the latter.

Prince Edward Island-
General, affected leaves averaging 6%.

POWDERY MILDEW, caused by
Podosphaera oxyacanthae (DC.) deBary

Saskatchewan-
Common on sand cherries at Saskatoon.

Manitoba-
On cherries at Morden.

BLIGHT, caused by Coryneum beijerinckii Oud.

Saskatchewan-
This blight was very severe on the leaves and fruit of the cultivated sand cherries at the University of Saskatchewan.

CURL, caused by Taphrina cerasi (Fcl.) Sad.

One case of this disease was observed in the Penticton district.

CURRANT

RUST, caused by Cronartium ribicola F. de Wal.

British Columbia, Coast and Kootenay-

The area in which the disease was discovered last year has been much extended, the disease being present at the Coast for over one hundred miles north of Vancouver and east to the Cascade Range. Unfortunately it has also been located in the Railway Belt of the Interior from Chase to Revelstoke and south to Beaton, Arrowhead and Mabel Lake. The disease on Ribes has been less severe than last year. Some plantations of R. nigrum which showed 100% telial infection in October last year showed little or none at the same time this year.

Ontario-

Commonly found throughout the district, but not as serious as leaf spots. Defoliation of many patches by this agency two to three weeks after the leaf spot defoliation.

Prince Edward Island-

One very severe case of this disease was found in Queen's County, in a plantation of black currants about 90% of the leaves were infected. This is the first record of its occurrence in this province. White pines growing in the vicinity did not show any symptoms of the disease.

LEAF SPOTS, caused by Mycosphaerella grossulariae Lag.
Pseudopeziza ribis Kle.

British Columbia, Coast and Kootenay-
Present in the Lower Maitland and Vancouver Island areas, but not serious.

Saskatchewan-
Present at Scott and Indian Head. Not severe.

Ontario-
Severe infections throughout the district, causing a heavy defoliation in many patches prior to the usual defoliation from these causes.

Prince Edward Island-
Leaf spots were much more in evidence this year, and in many cases the foliage was severely infected.

RUST, caused by Puccinia grossulariae Lag.

Saskatchewan-
Common on wild and cultivated currants and gooseberries.

Prince Edward Island-
Not observed this year.

POWDERY MILDEW, caused by
Sphaerotheca mors-uvae (Schw.) B. & C.

Saskatchewan-
Very severe on the twigs of black currants on the University plantation.

GOOSEBERRY

POWDERY MILDEW, caused by
Sphaerotheca mors-uvae (Schw.) B. & C.

British Columbia, Coast and Kootenay-
General, but not usually severe on American varieties

These constituted the majority of the varieties grown.

Prince Edward Island-
Not observed.

RUST, caused by Puccinia pringsheimiana Kleb.

Specimens of this disease were sent to the Central Laboratory, Ottawa, from Winnipeg, Man., and Matapedia, Que.

LEAF SPOTS, caused by
Mycosphaerella grossulariae (Fr.) Lind. Pseudopeziza ribis Kleb.

British Columbia, Coast and Kootenay-
Present, but not serious.

Prince Edward Island-
Very prevalent, though causing little apparent injury.

GRAPE

BLACK ROT, caused by Guignardia bidwellii (Ell.) V. & R.

Ontario-

Early infections were quite common in the local vineyards, but the disease was fairly well controlled by spraying. Many vineyards which had been poorly kept or were in dead air-pockets suffered up to 50% loss.

DOWNY MILDEW, caused by
Plasmopara viticola (B. & C.) Berl. & deToni

Ontario-
Reported present from all parts of the district. Loss not severe, up to 2%. Most of the infection was on leaves.

Quebec-
Common this year on leaves, tendrils, shoots and fruit.

POWDERY MILDEW, caused by Uncinula necator (Schw.) Burr.

Ontario-
Not serious enough to cause appreciable loss. Slight infection on berries in some vineyards.

DEAD ARM, caused by
Cryptosporella viticola (Red.) Shear.

Ontario-
Not as prevalent as reported last year. This disease was confused with chlorosis due to wet feet this year, in which case affected vines gradually recovered.

PEACH

CURL, caused by Taphrina deformans (Fcl.) Tul.

British Columbia, Okanagan Valley and Salmon Arm-
A few cases of the disease were observed where a spray had not been applied. Sprayed orchards sustained no loss.

Ontario-

About the usual amount present throughout the Niagara district. Few cases of severe defoliation. The growers seem well satisfied with the early spring spray as a control measure.

BROWN ROT, caused by
Sclerotinia cinerea (Bon.) Schr.

Ontario-

A few orchards near the lake suffered a severe early twig and blossom infection. Later infections on the fruit were continuous throughout the season, and in some orchards serious killing of the twigs was noticeable. The Mountain Rose variety were most susceptible to this latter type of infection. Specimens were obtained showing the development of discolored wood running 12-18 inches from the clinging rotted fruit. The loss due to brown rot was not of importance this year on account of the very heavy crop.

SCAB, caused by Cladosporium carpophilum Thüm.

Ontario-

Of little importance in this district. A few orchards reported a moderate infection, practically none in most.

YELLOWS: cause unknown

Ontario-

This disease is kept in check by the inspection service under the Ontario Government. A few isolated

trees were found in Lincoln County. These are all marked for eradication.

POWDERY MILDEW, caused by
Sphaerotheca pannosa (Wal.) Lev.

Ontario-
Found in orchards where air drainage is poor. Affected trees showed as high as 100% leaf infection. Not general in severity.

PEAR

FIRE BLIGHT, caused by
Bacillus amylovorus (Burr) DeToni

British Columbia, Okanagan Valley and Salmon Arm-
This disease has again been very serious in certain districts, while others have been almost free. In Salmon Arm, Vernon and Kelowna, blossom infection was severe in spite of a very vigorous attempt on the part of the growers to get their orchards clean during the winter. In the Penticton and Summerland districts the growers have obtained the upper hand, with the result that there were practically no losses this year. On the whole, however, conditions are improved over those of a year ago.

Ontario-
Most destructive disease of pears in the Niagara district. Very common this year on both apples and pears.

Prince Edward Island-
Not observed.

SCAB, caused by Venturia pyrina Aderh.

British Columbia, Coast and Kootenay-
Much less than usual. Even at the coast the fruit was almost clean.

Ontario-
Prevalent in many localities, causing a cracking of fruit where attacked heavily. Specimens were received from London, Ontario, showing very severe cracking and splitting of the fruit due to scab.

Prince Edward Island-
Very slight.

CROWN GALL, caused by Bacillus tumefaciens E.F.S.

Ontario-
A small orchard in Grantham township was severely attacked. Several trees were killed which on digging out were found to have a large number of galls of various sizes on the roots. The soil had been previously planted to raspberries.

CORE ROT: cause unknown

This trouble appears to be of a physiological nature, and is characterized by a breaking down of the fruit at the calyx end, and by the formation of an abnormal number of stone cells in the flesh. In the Penticton district one orchard was affected where about 5% of the fruit was lost. (Okanagan Valley and Salmon Arm)

PLUM

BROWN ROT, caused by *Sclerotinia cinerea* (Bon.) Schr.

British Columbia, Coast and Kootenay-
Of little importance this year.

Manitoba-
Present on plums at Morden.

Ontario-
Not serious until fruit ripened. Heavy infection at that time in many orchards. Loss not appreciable on account of heavy crop and low price.

Quebec-
Cultivated plums suffered to the extent of 1%.

Prince Edward Island-
Was found to a moderate extent. In no case, however, did it cause serious damage.

PLUM POCKETS, caused by *Taphrina pruni* (Fcl.) Tul.

Saskatchewan-
Severe at Rosthern. Reported from several places.

Manitoba-
Much more prevalent than usual. Severe at Winnipeg. Collected also at Cartwright and other points.

Ontario-
Quite prevalent, especially at Nairn Centre, Powassan and Ottawa.

Quebec-
Wild plums heavily infected; cultivated ones infected in Indian Lorette, Lanovaie and other places.

Prince Edward Island-
Not observed.

BLACK KNOT, caused by
Dibotryon morbosum (Schw.) T. & S.

Prince Edward Island-
Occurs in some districts, but is not general. Severe cases were only found in neglected orchards.

LEAF SPOT, caused by Coccomyces prunophorae Higg.

Not common. An orchard of Japanese varieties in Louth township suffered a moderate defoliation due to a combination of this disease and bordeaux spray injury. (Ontario)

RASPBERRY

MOSAIC; cause unknown

British Columbia, Coast and Kootenay-
Noticed this year in the Barnaby district, but did not seem to be doing any great degree of injury.

Ontario-
This disease is becoming increasingly important throughout the entire Niagara district. Considerable spread was reported in fruiting plantations and young plantations adjacent to these. It is hoped that the advent of certified disease-free stock will materially aid in the control of both leaf curl and mosaic.
In addition to the districts reported in last year's survey may be added:

Elgin County: (St.Thomas to Port Burwell)
13 plantations Cuthbert showing from 1 to 10% mosaic.
3 plantations Cuthbert apparently free.

Northumberland County: (near Brighton)
1 plantation Cuthbert - 7%.

Simcoe County: (near Waterford)
1 plantation Cuthbert 20 acres, near Port Rowan - 15%.

Other plantations near Waterford with 0 - 20% mosaic present. The younger plantations 2 - 4 years old are most severely affected in this district, indicating a comparatively recent introduction.

Quebec-

Was especially noticeable this season. In this district the Colombia variety was added to the susceptible list.

Prince Edward Island-

General this year, and in several cases more severe than in the previous season. Little spread, however, appeared to have taken place.

LEAF CURL: cause unknown

Ontario-

About the same prevalence as reported last year. Growers are taking a more active part in attempting to control this disease. Heavily affected plantations were dug out and new plantations are being carefully rogued.

Prince Edward Island-

The occurrence of this trouble this year was comparable to that of the previous. The Cuthbert was the only variety found to be affected.

SPUR BLIGHT, caused by Mycosphaerella rubina (Pk.) Jacz.

Ontario-

Prevalent to a slight degree in many localities, but not doing any damage. Most noticeable in the Herbert variety.

CROWN GALL, caused by Bacterium tumefaciens E.F.S.

Ontario-

Common, but not causing much damage in fruiting plantations. Reported as severe in a Snyder blackberry patch near Waterford, causing the formation of excrescenses on the canes for 1 - 2 feet above the ground.

ANTHRACNOSE, caused by Gloeosporium venetum Speg.

Ontario-

Not common on red varieties, but commonly found on black varieties throughout the district. Slight to severe on Marlboro in Waterford and London districts. Slight on Cuthberts near Waterford.

BLUE STEM, caused by Acrostalagmus caulophagus Lawrence

Ontario-

Found present in several plantations of black raspberries and in seedling plots at Vineland. The organism was isolated and its identity established by comparison with the original description given by W. H. Lawrence (Wash.Agr.Expt.Sta.Bul.108, 1912).

WINTER INJURY

Ontario-

Raspberry plantations three years old and upwards suffered severe winter injury in many localities. Entire plantations were destroyed in some cases. The injury was done after Feb. 6, 1922, but no attempt has been made to determine the actual cause or time.

STRAWBERRY

POWDERY MILDEW, caused by Sphaerotheca humuli (DC.) Burr.

Saskatchewan-

Rather severe at Saskatoon. Also present at Rosthern.

Ontario-

Present to slight degree in many parts of the district. No serious loss reported, as control measures are commonly practised against this disease.

Prince Edward Island-

General, and often severe. Average leaf infection in plantations examined - 12%.

LEAF SCORCH, caused by Mollisia earliana (E. & E.)

Ontario-

This is the most serious disease on strawberries in Southern Ontario. Losses up to 50% of the crop have been reported due to the defoliation of the plants and consequent poor set of fruit. Many patches showed up to 100% infection on leaves and petioles.

Applications of Bordeaux mixture give very good control for both this disease and leaf spot. Sulphur dust is useless.

Prince Edward Island-
Not observed.

LEAF SPOT, caused by
Mycosphaerella fragariae (Schw.) Lin.

Saskatchewan-
Present at Saskatoon. Not severe.

Ontario-
Generally distributed throughout the Niagara district. Only a few cases of loss up to 20% reported from this disease.

Prince Edward Island-
General in distribution, but in most cases the infection was slight.

APRICOT

WINTER INJURY

Considerable damage was caused by winter injury to the crown and roots. (Okanagan Valley and Salmon Arm)

QUINCE

RUST, caused by Gymnosporangium sp.

Ontario-
Of little importance, but present in isolated orchards in varying degrees of severity.

LEAF BLIGHT, caused by Fabraea maculata (Lev.) Atk.

Ontario-

Severe infection of the black spot or fruit spot stage of this disease was reported from Queenston district. Shipments of fruit showed a marked inferior condition due to this spot. No reports concerning leaf blight are available.

VEGETABLE AND FIELD CROP DISEASES

ASPARAGUS

RUST, caused by Puccinia Asparagi DC.

Not of serious importance; nevertheless it has been found wherever looked for late in the season. A few heavy infections noted.

RUSTY TIPS: cause unknown

A rusty browning of the marketable tips has been noted from time to time both in the gardens of growers and on the stock offered for sale. There is no indication that the yield is reduced, but many of the tips are unmarketable. This disease has been noted in New Brunswick, Quebec and Ontario.

BEAN

ANTHRACNOSE, caused by
Colletotrichum lindemuthianum (S. & M.) B. & C.

British Columbia, Coast and Kootenay-
Present in Fraser Valley, but not important.

Manitoba-
Severe on some varieties at Morden.

Quebec-
Prevalent, the season being ideal for its rapid development and spread.

New Brunswick-

Common everywhere on all bush beans; seldom if ever on pole beans. It frequently causes a loss of from 50% to 75%. Not so severe during the last two seasons, but more severe in 1922 than in 1921. In 1921 it did not develop until very late in the season on account of the exceptionally dry season. This disease is very much more common and injurious in New Brunswick than in Ontario or Western Quebec. It occurs on stems, leaves, pods and seed.

Prince Edward Island-

Very prevalent; severe in a few localities.

BACTERIAL BLIGHT, caused by
Pseudomonas Phaseoli E.F.S.

Saskatchewan-

Present, but not as severe as usual.

Manitoba-

Quite severe in some localities.

Quebec-

Prevalent, the season being ideal for its development and spread.

New Brunswick-

This disease does not develop to the same extent as in Ontario and Quebec, and is not nearly so destructive in New Brunswick. Usually present in the form of leaf spots. In 1920 some lots of beans were badly injured during early growth. Common, but not serious in 1922.

Prince Edward Island-

Generally distributed, and in some cases heavy infections were found. As a general rule, however, prevalence was moderate.

MOSAIC: cause unknown

Quebec-

Less noticeable, although frequent.

New Brunswick-

This disease is not common in New Brunswick, although noted in a number of gardens. It is known to be carried in the seed and to spread from diseased to healthy plants. Most beans planted in New Brunswick are obtained from Ontario sources; consequently, the amount present depends to a large extent on the conditions of the crop in Ontario and Quebec from which the seed came. It is impossible to give any general statement on the spread of the disease or the amount which might develop if the growers used local seed. Data available would indicate that it does not naturally spread rapidly under New Brunswick conditions. It has been noted in considerable abundance in former years in Ontario and Quebec.

STEM ROT and WILT, caused by
Sclerotinia libertiana (Fckl.)

Quebec-

Of local occurrence and quite common.

New Brunswick-

This fungus is present in a large proportion of the soil in the Experimental Station garden at Fredericton. It has caused serious loss to the bean crop during the last five seasons. In some sections the crop has been completely destroyed. It has been observed in

different sections of New Brunswick, Quebec and Nova Scotia.

RUST, caused by Uromyces appendiculatus (Pers.) Link.

New Brunswick-

This trouble has only been noted once on bush beans and three times on pole beans. When present it proved very destructive, attacking stems, leaves and pods, resulting in greatly decreased yields and inferior pods. If common this disease would be equally as serious as anthracnose.

BEET

New Brunswick-

Beets are grown only in home gardens and by vegetable gardeners, and then only to a very limited amount. There are no field sugar beets grown in New Brunswick.

RHIZOCTONIA

New Brunswick-

This disease occurs quite commonly, but not of serious proportions. Four years ago considerable injury was noted in the sugar beet fields of Southern Ontario.

SCAB, caused by Actinomyces scabies (Thax.) Güs.

The scab caused by this organism seldom occurs.

LEAF SPOT, caused by
Cercospora beticola Sacc.

New Brunswick-

This disease is quite common, and usually present to a limited extent, but no serious injury has been noted. Four years ago in Southern Ontario several fields visited showed many of the older leaves dead and badly infected, causing appreciable injury.

CABBAGE

BLACK ROT, caused by
Pseudomonas campestris (Pamm.)E.F.S.

Ontario-

Prevalent in many fields to a moderate extent. Loss not great, as the crop is heavy and prices are low.

CARROT

RHIZOCTONIA

New Brunswick-

This fungus frequently causes a storage rot of carrots. The trouble has not been noted in the field, but infection undoubtedly takes place before or at the time of harvesting. Not important.

ROT, caused by Sclerotinia libertiana Fckl.

New Brunswick-

A disease noted during 1920 and 1921, causing a yellowing and browning of the top and a browning of the crown

of the carrot is attributed to this fungus. The fungus was isolated from infected aarrots and also carrots showing rot in the spring. Its occurrence in different sections is suspected.

CELERY

LATE BLIGHT, caused by *Septoria petroselini* Desm.

Quebec-

Common and serious on Paris Golden, but Self Blanching was only slightly affected.

Ontario-

Especially destructive in storage beds, causing a rot of the leaves.

EARLY BLIGHT, caused by *Cereospora apii* Fr.

Ontario-

Very prevalent in Lincoln County and causing a serious loss in many plantings.

New Brunswick-

Not common nor ordinarily destructive; one very severe outbreak noted.

SOFT ROT, caused by *Bacillus carotovorus* E.F.S.

New Brunswick-

Occasionally soft rot becomes troublesome, developing late in the season. No cases noted in 1922.

CUCUMBER

ANTHRACNOSE, caused by Colletotrichum lagenarium (Pers.) E. & H.

New Brunswick-

Present, but not noted as being severe during the last two seasons. Three years ago several cucumber fields were severely infected, causing heavy losses, both vines and fruit being injured. The disease has also been noted as causing considerable injury to pumpkins, particularly on the fruit.

WILT, caused by Bacillus tracheiphilus E.F.S.

New Brunswick-

This disease has not been noted; wilted vines have been observed, but could not be attributed to this organism.

Quebec-

Occurred in practically every plot. The wilting was of the slow-developing type.

MOSAIC: cause unknown

New Brunswick-

The mosaic of Cucumbers is common in gardens on the lower St.John River; several severe cases have been noted and others reported.

LETTUCE

DROP, caused by Sclerotinia libertiana Fckl.

New Brunswick-

This disease almost invariably develops on plants left in the gardens until the flower stalks commence to form. It is frequently accompanied by Botrytis infection.

ONION

SMUT, caused by Urocystis cepulae Frost

Quebec-

Was serious in several large areas near Montreal.

DOWNY MILDEW, caused by Peronospora schleideni Ung.

Quebec-

Occurred in isolated areas, and while alone it was not serious, great loss was sustained because it was followed rapidly by a Botrytis sp.

NECK ROT, caused by Botrytis alii Munn.

Saskatchewan-

Present in stored onions at Saskatoon.

PINK ROOT or ROOT ROT, caused by Fusarium malli Taub.

Quebec-

Present and serious, the wilted leaves being attacked

by a Botrytis sp. and the loss aggravated.

PEA

POWDERY MILDEW, caused by Erysiphe polygoni DC.

British Columbia, Coast and Kootenay-
Present in garden peas, but generally appearing too late to do much harm.

Prince Edward Island-
Present, but to a slight extent; not general.

ROOT ROT, caused by various fungi - undetermined.

Ontario-
Out of 3,000 acres of peas in the Wellington district of Prince Edward County, about 14% loss was sustained. This loss is placed at $12,000 for 1922 (J.F.Hockey). In certain parts of the province, especially in Prince Edward County, there has been a great deal of trouble with wilt and blight of canning peas. This trouble is probably due to a fusarium, at least in part, the exact species I am not prepared to state. The same disease is present to some extent in other canning regions of the province, but not quite as bad as in Prince Edward County (R.E. Stone).

MOSAIC

Quebec-
This disease was found in rather isolated areas.

PEPPER

BLOSSOM END ROT: cause unknown

British Columbia, Okanagan Valley and Salmon Arm-
Caused considerable damage wherever peppers were grown.

In the case of one grower the loss was 45% of the crop.

TOMATO

WESTERN YELLOW BLIGHT: cause unknown

British Columbia, Okanagan Valley and Salmon Arm-
Severe only in Osoyoos and Keremeos districts, causing losses of from 15 to 30% of the crop.

BLOSSOM END ROT: cause unknown

British Columbia, Okanagan Valley and Salmon Arm-
Of general occurrence. Not severe.

LEAF SPOT, caused by Septoria lycopersici Speg.

Ontario-
Very prevalent throughout the Niagara district, causing up to 75% reduction in yield. This disease continued for some time and completely defoliated many crops.

New Brunswick-
This fungus causes considerable damage to tomatoes in New Brunswick. It was not noted as being severe in 1922. Among the growers in the Grand Lake section it causes heavy losses, some reporting as high as 50% of the crop, due to premature defoliation of the plants.

LEAF MOLD, caused by Cladosporium fulvum Cke.

New Brunswick-

Identified on tomato fruit collected at the Experimental Farm. Occurrence elsewhere not noted.

DOWNY MILDEW, caused by
Phytophthora infestans (Mont.) DeBary

New Brunswick-

Has been reported in previous years. One garden at New Castle was severely infected this year. It is probably more prevalent than observations indicate.

EARLY BLIGHT, caused by
Alternaria solani (E. & M.) J. & G.

Quebec-

Very common during late August and September, and spotting of the fruit with a subsequent rot occurred in September.

New Brunswick-

Noted in several gardens, but not considered of importance. Only definitely identified on specimens from three sources,

ANTHRACNOSE, caused by
Colletotrichum phomoides (Sacc.) Chest.

New Brunswick-

This disease has frequently been observed on tomatoes in the Experimental Farm garden in former years, but not noted in 1922.

MOSAIC: cause unknown

Quebec-

Present, but not to the same extent as in 1920 and 1921.

New Brunswick-

Observed in only one garden in 1922. Three plants showed well-marked Mosaic and did not produce an average crop. The disease was also observed in one garden in 1921. It is not common in New Brunswick.

Prince Edward Island-

General, but not severe.

WILT, caused by Sclerotinia libertiana Fckl.

New Brunswick-

This fungus has been identified with the premature death of individual plants on the Experimental Farm during the last three seasons. It has not been noted elsewhere.

TURNIP

CLUB ROOT, caused by Plasmodiophora brassicae Wor.

New Brunswick-

This disease is the most widely distributed and most destructive disease of turnips and cabbage in New Brunswick. There is no section free from it; possibly this is due largely to the fact that most soils in the province are acid. The sections most severely infected are in the live stock or mixed farming sections. Some live stock men, particularly in parts

of Westmoreland, Albert, King's and Queen's Counties, are unable to successfully grow turnips on account of the disease. The truck growers on the lower St.John sustain heavy losses with their cabbage and turnip crop through Club Root.

Prince Edward Island-
Very few cases observed. Moderate in severity.

BLACK ROT, caused by
Pseudomonas campestris (Pammel) E.F.S.

New Brunswick-
The black rot of cabbage is present in most fields to the extent of approximately ½ of 1%, but not considered serious.

SOFT ROT, caused by
Bacillus carotovorus Jones

New Brunswick-
Soft rots are present in practically every field of turnips or cabbage. Apparently they are more abundant following heavy infestations of aphis. Localized sections of fields are frequently badly injured. Damage estimated at 2%.

WHITE RUST, caused by Cystopus candidus (Pers.) Lev.

New Brunswick-
Have noted it on three occasions; not believed to be of importance.

DOWNY MILDEW, caused by
Peronospora parasitica (Pers.) DeBary

New Brunswick-
Always present, particularly late in the season, but no apparent injury.

STORAGE ROTS

New Brunswick-
Probably caused by various organisms; species of Bacteria, Fusaria, Botrytis and Sclerotinia have been isolated. Frequently 10 to 25% and even more of the turnips placed in storage rot before spring are affected, particularly if not kept very cool and well ventilated. This heavy percentage of rot is also believed to be due to the fact that turnips grown here show no signs of maturing before harvesting.

RHUBARB

CROWN ROT: cause unknown

A disease probably due to bacteria, is prevalent in Saskatchewan. It seems to be increasing in severity.

ORNAMENTAL PLANT DISEASES

ASTER

WILT, caused by Fusarium conglutinans Wall.

Ontario-

Very common this year, causing considerable losses in private gardens and commercial aster plantations.

STEM ROT, caused by Sclerotinia libertiana Fckl.

New Brunswick-

This fungus has been frequently noted as causing a stem rot of asters at the Experimental Station, Fredericton, but not elsewhere. It has also been noted on numerous other flowering plants in the same vicinity. Whole patches of flowers have been killed down in August and September. It was also noted on sunflowers in 1920 at Middleton, N.S.

YELLOWS: cause unknown

Ontario-

Common at the Experimental Farm, Ottawa, but not as bad as last year.

New Brunswick-

This is by far the most serious disease. During the last seven years not a single aster bed has been examined which did not contain a large proportion of injured plants; frequently from 50 to 75% were infected. The trouble is equally distributed in all sections of the province.

BARBERRY

RUST, caused by Puccinia graminis Pers.

Manitoba-
The aecidial stage was present on barberries in the city of Winnipeg, but not at all severe.

HOLLYHOCK

RUST, caused by Puccinia malvacearum Mont.

New Brunswick-
This disease is very destructive; no plants have been examined which were free from it. A hedge set in May this year, was almost completely defoliated by September. Other such cases have been reported. Some varieties show some resistance.

HONEYSUCKLE

POWDERY MILDEW, caused by
Microsphaera alni (Wall.) Salm.

Manitoba-
Quite severe at Morden.

IRIS

RHIZOME ROT, caused by
Bacillus carotovorus E.F.S.

Ontario-
Iris growers in Ottawa have experienced severe loss from this disease, particularly in the more recently introduced varieties.

Quebec-

Prevalent wherever this plant is grown. There appears to be little doubt that injury to the rhizomes during spring cultivation opens points of infection in the plants.

PEONY

LEAF AND STEM SPOT, caused by
Septoria paeoniae West var. *berolinensis* Allesch.

Quebec-

Very prevalent.

OTHER DISEASES

Quebec-

During the late summer an *Alternaria* leaf spot and *Cladosporium* blight became common. In one large nursery the roots of newly planted peonies blackened and died. They were like india rubber in texture. The trouble appears to be due to a *Fusarium* sp.

ROSES

RUST, caused by *Phragmidium* spp.

Manitoba-

Rust of the genus *Phragmidium* was very common on wild roses and present on the cultivated roses at Morden.

SWEET PEA

STREAK, caused by *Bacillus lathyri* M. & T.

Québec- Occurred frequently, especially during September.

MOSAIC: cause unknown

Quebec- Mosaic was noticeable in many plots, but was not so common as "stigmonose" and leaf curl caused by aphids.

FOREST AND SHADE TREE DISEASES

ARBOR VITAE

RED BRANCH (See BALSAM)

BALSAM

RED BRANCH (See also ARBOR VITAE, PINES and SPIKE BRANCH of SPRUCE)

The commonest theory for the cause of this disease is that of snow pressure, but it has been found that the most frequent cause is a combination of two factors, namely, insect gnawing of the bark and the subsequent drying out of the living tissues at the same level.

This disease is of frequent occurrence in Eastern Canada. The dead, red-needled branches are conspicuous against the dark green setting of normal, living foliage.

The insects concerned are bark beetles of the genus Monohamus. The so-called Spike Branch disease of Spruce is brought about by the same cause.

(J.H. Faull)

BUTT and HEART ROTS, caused by various fungi

The amount of loss due to butt and heart rot fungi of forest trees generally is enormous; they are easily the most destructive agents of the forest. Mature stands will show a destruction up to 50% or more. The butt rots as a rule do not extend more than a few feet from the ground, while

the heart rots work throughout the merchantable parts of the trunks.

In the balsam there are three important butt rots and one heart rot. Some of the fungi found associated with the butt rots have been Polyporus balsameus Peck, Poria subacida Pers. and possibly Polyporus schweinitzii Fries. The heart rot known in Quebec as "hemlock rot" of balsam, is probably the outstanding menace of the balsam stands of Eastern Canada at the present time. In some stands recently cut, over 65% of the timber has been rejected from this cause. Its definite distribution cannot be stated, but so far it has been found in Northern Ontario, Western Quebec and is extremely common in middle and Eastern Quebec.

(J.H. Faull)

RUSTS

Among these, the rusts which have various ferns as their secondary hosts cause the greatest damage, especially to seedlings and younger trees. The other rusts are probably of little or no economic importance at any time.

Caeoma arctica with the alternate phase Melampsora arctica on willows has been found on balsam in Nova Scotia but has not yet been reported from Ontario.

The following is a list of the balsam rusts found in the Temagami Forest Reserve with their alternate hosts:-

Abies Balsamea	Alternate Hosts
Peridermium columnare (O & I) Blueberry Rust of balsam	Calyptospora columnaris (III) on Vaccinium pennsylvanicum and V. canadense

Per

Abies Balsamea	Alternate Hosts
Peridermium pustulatum (O & I) Fireweed rust of balsam	Pucciniastrum pustulatum on Epilobium angustifolium (II & III) and E. adenocaulon (II & III)
Peridermium balsameum (O & I) Fern rusts of balsam	Uredinopsis Osmundae (II & III) on Osmunda claytoniana and O. cinnamomea U. mirabilis II & III on Onoclea sensibilis U. Struthiopteridis II on Onoclea struthiopteris U. Phegopteridis (II & III) on Phegopteris Dryopteris U. Atkinsonii (II & III) on Asplenium filix-foemina
Peridermium pycnogrande Bell. (O & I) Fern rust of balsam	U. polypodophila Bell. (II) on Polypodium vulgare (Connection with balsam not yet established by artificial inoculations)
Peridermium pycnoconspicuum Bell. (O & I) Fern rust of balsam	Hyalospora Aspidiotus (II) on Phegopteris Dryopteris
Peridermium elatinum (O & I) Chickweed rust of balsam	Melampsorella elatina (II) on Cerastium vulgatum and Stellaria graminea

(J.H. Faull)

BUTTERNUT

LEAF SPOT, caused by Gnomonia veneta Kleb.

Quebec-

Practically all the butternut trees were defoliated at least a month earlier than normally.

ELM

LEAF SPOT, caused by Dothidella ulmi Duv.

Quebec-

Most of the American elms in Eastern Quebec carried

approximately a 30% infection.

HORSE CHESTNUT

LEAF SPOT, caused by
Phyllosticta sphaeropsidea E. & E.

Ontario-
Very prevalent throughout Southern Ontario, causing a heavy defoliation in mid summer and later.

PINES (See also WHITE PINES)

RED BRANCH (see BALSAM)

POPLARS

RUST, caused by Melampsora medusae Thum.

Manitoba-
Quite severe on poplars at Morden, causing defoliation. Collections were also made at other places.

MILDEW, caused by Uncinula salicis (DC.) Wint.

Manitoba-
Common in shady places.

SPRUCE

SPIKE BRANCH (See RED BRANCH of BALSAM)

WHITE PINES

BLISTER RUST, caused by
Cronartium ribicola F. de Wald.

See also under CURRANTS Page 35.

Pinus monticola Dougl.

British Columbia-
Infected trees have been found closely associated with diseased currants and gooseberries. At Daisy Lake on the Pacific Great Eastern Railway rust is epidemic. On a plot of two acres, 80 trees from 1 to 5 inches in diameter have been killed. In many cases, as a result of the large number of separate infections, death has occurred previous to the production of aecidia.

Pinus albicaulis Engelm.

British Columbia-
One case of infection on this species was found in the university grounds at Point Grey.

Pinus strobus L.

Eastern Canada-
No diseased white pines were found at the northern limits of distribution of the rust.

In Nova Scotia the disease was found at the following points: Kentville, Weymouth, Truro, River John, Nappan, Pictou and Rockingham Station. In all cases it was the cultivated black currant (Ribes nigrum L.) which was infected.

In New Brunswick rust was found at Little Shemogue on black currants.

WILLOW

CANKER, caused by Dothichiza populea S. & B.

New Brunswick-
Trees dying, presumably from this cause, have been noted near Port Elgin, Little Shemogue and Bayside.

INDEX

DOMINION OF CANADA,

DEPARTMENT OF AGRICULTURE,

EXPERIMENTAL FARMS BRANCH.

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SURVEY OF THE PREVALENCE OF PLANT DISEASES IN THE DOMINION OF CANADA.

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EDITED BY

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INTRODUCTION

The following report deals with the prevalence of plant diseases in the Dominion of Canada during the year 1923. It includes 102 host plants, with information on 333 diseases. These may be divided as follows:

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CEREAL DISEASES

WHEAT

STEM RUST, caused by Puccinia graminis Pers.

B.C.-

Either absent or present in very small amount in the mixed farming districts. No Berberis spp. were noticed in this region, which may account, in part at least, for the comparative freedom from this disease.

Alta.-

The areas affected were much extended this year, and the disease was more prevalent than in any other year, but was too late to do much serious damage. At Beaverlodge and the College of Agriculture in Edmonton the infection was slight.

Sask.-

The rust first appeared on barberries in Saskatoon on May 28. On June 29 it was collected on Hordeum jubatum, Agropyron tenerum and A. Smithii in the vicinity of the barberries at Saskatoon. On July 7, aecia with spores discharged were found at Regina. On July 10, uredospores found on Hordeum jubatum at Weyburn. Localized. On July 11, collected on wheat at Weyburn and Midale, a few pustules only. On July 19, collected on wheat at Saskatoon. On July 20, traces at Rosthern. The losses in the province as a whole were very considerable. At Indian Head, rust appeared to become quickly established on Kubanka, which lodged badly. On Ruby, the infection was mostly primary, but with some secondary in addition.

The disease soon became general over the south of the province, doing much damage, expecially to late crops. The degrees of infection noted in various parts of the province are herewith tabulated:

Losses up to 10%	Losses up to 25-50%	Losses up to 75-100%
Scott	Assiniboia	Moose Jaw
Francis	Admiral	Vanguard
Wolseley	Scotguard	
Grenfell	Ponteix	
Broadview	Griffin	
Sintaluta	Weyburn	
Saltcoats	Wymark	
	Indian Head	
	Swift Current	
	Neville	
	Shaunavon	
	Yorkton	

(Fraser & Simmonds)

Man.-

Spring floods left some of the soil in a very wet condition at seeding time, and in some areas crops were drowned out by heavy rains or high water. There was ample rainfall during the season over some of the western part of the province, although the summer was rather dry in the Red River Valley and adjacent areas. The temperature was generally high during July. Pycnia were first found on May 31 at Winnipeg, and the aecia were open first on June 5. This was somewhat later than usual, on account of the backward spring. The uredo stage on wheat was found in considerable quantity in a small local area on winter wheat (Dawson's Golden Chaff) at Brandon on July 5. Infection may have started there from spores from a barberry bush, although

no barberries were within a mile or more.

By July 6, 5 to 10% primary infection was common in Southern Manitoba, and a lighter scattering of primary infections existed very generally elsewhere (Portage la Prairie, Carberry, Dauphin). Subsequent development of the rust was very rapid; on July 18, in central and southern Manitoba infection was practically universal, and the severity was commonly 70 to 80%.

A trip was taken by boat over Lake Winnipeg, and a week (August 11 to 16) spent at Norway House on the 54th parallel. Stem rust was found along the shore of the lake in lessening quantities as we went north. At Norway House the rust was quite common on timothy, indicating over-wintering there. A trace was found on oats; none was found on wheat, but a great deal of search finally revealed a couple of pustules on Hordeum jubatum. The oats, wheat or rye forms had apparently blown there, and were just beginning to show by the middle of August. About thirty barberry plantings, for the most part of one, two or three bushes, located this year, were quite generally rusted, but there was no indication of rust having spread from them significantly, in advance of the general epidemic.

Throughout the province rust was very serious, causing about 50% loss of the wheat that was harvested, amounting to a reduction of about 35,000,000 bushels, or in

money value from 15 to 35 million dollars. These losses were greater this year than in any year since 1916.

(Bisby & Bailey)

The losses experienced in different parts of the province are herewith tabulated.

Losses up to 25%	Losses up to 30-50%	Losses up to 75-100%
Plum Coulee	Franklin	Letellier
Elm Creek	Gretna	Morris
Minitonas	Snowflake	Emerson
Shoal Lake	Inwood	St.James Co.
Argyle	Strathclair	Stonewall
La Riviere	Erickson	
Gladstone	Swan River	
Neepawa	Morden	
Portage la Prairie		
Carman		

Ont.-

Reports were received from Thunder Bay, Essex and Algoma showing very severe infections in those localities. One from West Whitley indicates an infection there of moderate severity.

Que.-

Reports from Matane and Sherbrooke show severe infestations.

N.S.-

Severe infections in Piedmont and Merigomish, and slight injury in Colchester County were reported.

P.E.I.-

A summary from this province reports a moderate infection, averaging 10%.

LEAF RUST, caused by Puccinia triticina Eriks.

Alta.-
Generally prevalent, but not enough to do any serious damage. Quite severe at the College of Agriculture in Edmonton.

Sask.-
Generally prevalent in Northern Saskatchewan. First collection made July 3 at Indian Head, occurring commonly after this date, later becoming severe and killing many leaves.

Man.-
General, with infections ranging from 8 to 25%, but for the most part, the losses were slight. It is not serious on the commonly grown varieties of spring wheat, but Kota and the winter wheats were heavily infected at the Experimental Farm at Brandon.

Ont.-
Prevalent in the Sault Ste.Marie district and in severe form.

P.E.I.-
A general infection,averaging about 10%.

BUNT or STINKING SMUT, caused by Tilletia laevis Kühn and Tilletia Tritici (Bjerk.) Wint.

B.C.-
In the central section of the province very little of this disease was observed, even where the seed had not been treated.

Alta. and Sask.-
Very little of this observed.

Man.-

Unusually rare. Not reported except occasionally in experimental plots.

Ont.-

Apparently absent.

P.E.I.-

Rare, and where found, only to the extent of 1%.

LOOSE SMUT, caused by Ustilago Tritici (Pers.) Jens.

B.C.-

General, but of small account, and rarely reaching more than 2%.

Alta. and Sask.-

Small percentage, not exceeding 1%, present generally.

Man.-

Fairly common, infections ranging from a trace to 2%.

Que.-

A number of reports indicate the presence of a trace except from Matane and Bonaventure Counties, in which infections averaging 12% were found.

N.S.-

At least 5% was found in all untreated plots at Nappan; Ruby, Huron, Marquis and Bishops having considerable, Early Red Fife, Red Fife and White Russian only a trace.

P.E.I.-

Infections varying from 1% to 3% found in isolated areas.

ERGOT, caused by Claviceps purpurea (Fr.) Tul.

Alta. and Sask.-
There was more present than usual. It was not general, but many plots at the Experimental Stations and Agricultural Colleges showed a small percentage.

Man.-
No record.

P.E.I.-
One field containing 5% was found in Prince Co.

SCAB, caused by Giberella Saubinetii (Mont.) Sacc.

Man.-
At Brandon the plots showed infections ranging from a trace to 5% in the spring wheats, Marquis giving the highest counts, the Durums showing no infection. The perfect stage was found for the first time by Messrs. Bisby and Bailey on old corn stalks of the 1922 crop in the field, but it has not been found causing injury to the corn.

P.E.I.-
A slight infection reported.

FUSARIUM BLIGHT, caused by Fusarium spp.

Alta.-
More prevalent than usual, although not severe in any place.

Sask.-
In northern Saskatchewan, some plots were found with as much as 5%. At Indian Head a slight infection was observed. This disease generally was more prevalent than usual.

FOOT ROT, caused by Fusarium spp.

At Brandon, some specimens were sent in or noted where the roots were severely rotted. The plants, in many cases, had made almost normal growth and were well headed out. However, they ripened slightly sooner than normal plants and practically no seed was found in the heads. (I.L. Conners)

TAKE-ALL, caused by Ophiobolus cariceti (Berk. et Br.)Sacc.

Present and severe in a field of wheat in northern Saskatchewan. Not found elsewhere. (W.P. Fraser)

GLUME BLOTCH, caused by Septoria nodorum Berk.

Alta. and Sask.-

Of general occurrence and worse than usual. Practically every place visited in these provinces showed more or less of this disease. The leaves, nodes and glumes were severely attacked. This was specially noticeable on plants broken down by the wind or cut down by the saw fly. Probably the death of the leaves caused some reduction in yield. (W.P. Fraser)

In Saskatchewan, observations by P.M. Simmonds showed the following approximate distribution of infections:

Trace	Moderate	Severe
Antler	Scott	Sintaluta
	Shaunavon	Moosomin
	Moose Jaw	Indian Head
	Weyburn	
	Griffin	
	Grenfell	
	Arcola	
	Rouleau	

Man.-

In the south-west this disease was prevalent on the Experimental Farm at Brandon, Boissevain and Deloraine. The leaves were heavily infected and 10 to 15% of the heads showed lesions on the glumes. It probably did a slight amount of damage. In the western part of the province considerable developed, causing often a conspicuous blotching of the glumes. The disease was found at the Agricultural College, but caused no noticeable damage in the Red River Valley.

Que.-

A few collections were made at Macdonald College.

P.E.I.-

This disease was not observed.

HEAD BLIGHT and FOOT ROT, caused by
Helminthosporium sativum P.K.et B.

In Alberta and Saskatchewan this disease was more common than usual, especially as a foot rot. It appeared in a large number of fields, but with no great damage resulting, as only plants here and

there were attacked. In south-western Manitoba it was collected frequently on wheat, but caused no appreciable damage except occasionally on Durum wheats, where the nodes were affected.

A root rot probably caused by this fungus occurred to a considerable extent in Alberta at Beaverlodge and in Saskatchewan at Scott, Indian Head, Moosomin, Moose Jaw and Shaunavon. Local cases of this also occurred in Manitoba.

POWDERY MILDEW, caused by Erysiphe graminis DC.

In Alberta this was present to a limited extent on winter wheat. In Quebec, at Macdonald College there was the heaviest infection for some years.

BASAL GLUME ROT, caused by Bacterium atrofaciens McC.

Alta.- Very prevalent throughout the province. At Edmonton some varieties were heavily infected; at Lacombe infection seemed worse on Red Bobs, Early Red Fife and Early Triumph.

Sask.- In the northern part of the province it was prevalent; in some fields a large percentage of heads were affected. In the southern part infections were general, the following distribution being reported:

Trace	Moderate Infection
Indian Head	Weyburn
Griffin	Sintoluta
Grenfell	Moose Jaw
Wymark	Shaunavon
Swift Current	

Man.-

Traces were noted at the Brandon Experimental Farm. Dawson's Golden Chaff showed approximately 5% heads slightly attacked.

BLACK CHAFF, caused by Bacterium translucens undulosum S.J. & R.

Some specimens of this disease were found in Manitoba, but the damage was slight.

PHYSIOLOGICAL DISEASES

WHITE TIP

The top part of the head is dead and bleached and was probably the result of extremely hot weather during July. A trace was found in Saskatchewan, but in Manitoba it was more prevalent and severe.

KRINKLE JOINT

At Indian Head, a rod row of the variety Preston was found to contain 10% of affected plants.

OATS

STEM RUST, caused by Puccinia graminis Pers.

Alta. and Sask.-

Prevalent in northern Saskatchewan and extended into Alberta. It was not as severe there as in southern Saskatchewan, where the approximate distribution was as follows:

Slight	Moderate
Ponteix	Swift Current
Shaunavon	Wymark
Yorkton	Assiniboia
	Moose Jaw

Man.-

In the south-west the disease was much slower in making its appearance on oats than on other cereals. A single pustule was collected at Cartwright on July 16. On July 19 a trace infection was collected on the plots at Brandon, one to four pustules on a few plants being found. On August 8 at Manitou, 40% infection, half in the telial stage, was found. At Cartwright 30 to 40% infection was common; one field later than the rest showed 50% infection and was injured to some extent. At Boissevain the infection averaged 20%. In general the injury was slight through this area. (I.L. Conners)

In the south-east this disease was abundant and doing considerable damage. Much of the early crop escaped, but in all sections the late crop and in many sections the whole crop was severely injured. (Bisby and Bailey)

The approximate distribution is as follows:

Slight	Moderate	Severe
Elm Creek	Emerson	Stonewall
Letellier	Tretna	Minitonas
Shoal Lake	Swan River	Dauphin
Wood Bay	Erickson	Morris
Portage la Prairie	Strathclair	
	Morden	
	Carman	

Ont.-

One report from Lanark Co., where the infection was severe and the heads not filled. Reports from Algoma and Ontario Counties also show general prevalence and in severe form.

Que.-

Prevalent in the Eastern Townships, although not affecting early varieties such as Daubeney and Alaska, to any extent.

N.S.-

General infections reported from Hants and Colchester Counties, but not causing much reduction in yield.

P.E.I.-

In Queens and Kings Counties slight infections are reported.

CROWN RUST, caused by Puccinia coronata Cda.

Sask.-

The aecial stage of this rust was severe on buckthorn in some districts. There was a marked development of the rust at Saskatoon and other districts in northern Saskatchewan.

In southern Saskatchewan the approximate distribution of infection was as follows:

Slight	Moderate	Severe
Shaunavon Sintoluta Weyburn	Assiniboia	Indian Head

Man.- In the south-west the disease was severe in the general region of Boissevain. Two buckthorn hedges were located, one in town and another on a farm one mile south of the town; both of these were heavily infected. The hedge on the farm was planted on high ground about two hundred yards from an oat field. Early examinations showed no striking differences in infection, but later in the season the infection on the sheath showed slightly higher near the buckthorn. The infection on the leaves was 65% and on the sheaths 10 to 20%. At Cartwright there was 10% leaf rust and at Manitou 50%, there being no noticeable sheath infection. At Brandon a medium infection was noticed. (I.L. Conners)

In the south-east buckthorns were generally but lightly infected. Infection on oats was patchy, depending apparently on the proximity of the buckthorns. Some damage was done in local areas, but in general slight. (Bisby & Bailey)

The approximate distribution of infections was as follows:

Slight	Moderate	Severe
Neepawa	Erickson	Strathclair
Gladstone	Shoal Lake	Swan River
Morden	Carman	Dauphin
	Portage la Prairie	
	Minitonas	
	Morris	

Ont.-
Moderate infections reported from the following districts: Sudbury, Missisquoi, Essex and Thunder Bay.

N.S.-
In Colchester County a ten-acre field is reported as being generally infected without much apparent injury.

SMUTS, caused by Ustilago Avenae (Pers.) Jens. and Ustilago levis (K. & S.) Magn.

B.C.-
General, but almost entirely of the covered type. Occasionally as high as 40% in untreated seed, but not over 5% on the average.

Alta.-
One report from Beaverlodge indicates that the disease is present in that neighbourhood but is well controlled by formalin seed treatment.

Sask.-
The covered smut was common in many fields, in some being as high as 10 to 25%. Not much loose smut was observed. The approximate distribution was as follows:

Trace	Slight	Moderate
Moosomin	Grenfell	Rouleau
Carlyle	Shaunavon	Moose Jaw
Estevan		
Swift Current		

Man.-

In the south-west these smuts are not uncommon. Counts made in three different fields showed approximately 10% in each case. Smutted plants were dwarfed, being about one-third shorter than the normal ones. They seemed to mature less rapidly, and consequently smutted plants showed 80% stem rust infection against 40% on normal plants. Liberty (hulless) oats showed upwards of 50% infection at the Brandon Experimental Farm. (I.L. Conners)

In the south-east, infections were about the same as usual, ranging from 0 to 2%, with occasional fields going higher. (Bisby & Bailey)

Severe infections were noted in Minitonas and slight at Morden and Elm Creek.

Ont.-

The following reports indicate the approximate distribution:

Slight	Moderate	Severe
Frontenac	Ontario	Hastings
Renfrew	Temiskaming	Thunder Bay
Carleton	Essex	
	Sudbury	

Que.-

The reports received indicate the following approximate distribution:

Slight	Moderate
Matane	Bonaventure
Sherbrooke	Stanstead
Rimouski	

N.B.-

Untreated seed showed infections ranging from 4 to 50%.

Treated seed in the same districts showed 0 to 5%.

N.S.-

At Nappan there was considerable smut in the Liberty variety; in others there was a trace only. In Antigonish, Colchester and King's Counties infections were moderate.

P.E.I.-

Reports from the three counties indicate infections ranging from 1 to 5%.

ANTHRACNOSE, caused by Colletotrichum cereale Manns.

This disease was reported from southern Saskatchewan. The nodes and bases of the leaves were the parts mostly affected. At Indian Head, field counts gave 60% of the plants affected. It was less severe and common in other districts, such as Weyburn, Moose Jaw and Shaunavon. (P.M. Simmonds)

POWDERY MILDEW, caused by Erysiphe graminis DC.

One report from Macdonald College, Quebec, where the infection was the heaviest for some years.

LEAF SPOT BLOTCH, caused by Leptosphaeria avenaria Weber

This disease was found on the Experimental Farm at Brandon. Typical pynnidia (Septoria avenae Frank) were found scattered among telia of crown rust. An ascomycete which agreed with Weber's description of

Leptosphaeria avenaria was also present in one collection.

Dr. Bisby kindly corroborated these observations. Ascospore measurements gave length 16-28 u, average 23 u; width about 5 u. Twenty-five pynospores gave length 18-36 u, average 25.8 u; width 2-3 u. This material may have been slightly immature.

(I.L. Conners)

LEAF DISCOLORATION, caused by Helminthosporium sp.

Quite common in southern Saskatchewan.

HALO BLIGHT, caused by Bacterium coronofaciens Elliott

This disease is common on the leaves of oats in northern Saskatchewan and Alberta.

PHYSIOLOGICAL DISEASES

BLASTING OF HEADS

In southern Saskatchewan it is reported as common at Shaunavon and Indian Head. The heads contain a number of non-fertile flowers, the glumes being white and dead.

LEAF BLIGHT

In the rotation experimental plots at the Central Experimental Farm, one field has for ten years failed to yield healthy oat plants. In the early summer of 1923 the diseased condition again appeared. When the plants are four or five inches high the leaves develop pale patches with brown or reddish edges, and finally droop and wither. Large dead areas occurred in the field, which quickly became filled with weeds, principally Polygonum pennsylvanicum. This is apparently the same disease as the one described in Europe as "Grey Speck" or "Yellow Tip", vide Abstracts in the Review of Applied Mycology, Vol.1, pp. 417 and 421. Dr. Dickson reports a similar disease occurring in the oat plots at Macdonald College, with losses ranging from 20 to 80%.

BARLEY

LOOSE SMUT, caused by Ustilago nuda (Jens.) K. & S.

Alta.-
One report from Beaverlodge, stating that this smut has been prevalent, but is now well controlled by the hot water treatment.

Sask.-
Not as prevalent as usual.

Man.-
Fairly common, but percentages of infection low.

At Brandon some differences in varietal susceptibility

were noted as follows:

Charlotte No.80	0	Himalayan	Tr.
Trebi	0	Stella	0
Albert	Tr.	Manchurian	Tr.
Junior	6%	Chinese White	Tr.
O.A.C.No.21	0	Bearer	0

Ont.-
From four reports the average infection appears to be approximately 2%.

Que.-
Average infection about 4%.

N.B.-
One report indicating a 2% infection.

P.E.I.-
Three reports average 3% infection.

COVERED SMUT, caused by
Ustilago Hordei (Pers.) K. et S.

Sask.-
Considerable present in many fields, in some cases 10% was observed.

Man.-
Generally present; infections from trace to 5%.

Ont.-
Infection average less than 1%.

STEM RUST, caused by Puccinia graminis (Pers.)

Alta. and N.Sask.-
Common in northern Saskatchewan and extending into Alberta.

S.Sask.-
Moderate infections in Vanguard, Moose Jaw and Indian Head; slight in Francis.

Man.-
In the south-west it was observed on barley as soon

as wheat. At Cartwright on July 16 a light infection from a trace to 5% was observed in one field. At Killarney it was slightly heavier and at Boissevain 1 to 2 pustules on a few plants were found. At Manitou on August 8, two fields showed 30% and 60% respectively, similar infections being found at Cartwright and Boissevain. At Brandon, the plots showed great variation, running up to 50%. This disease probably caused little injury except in late seedings.

(I.L. Conners)

In the south-east it was abundant and injurious, especially on late sown barley.

The approximate distribution of infections was as follows

Slight	Moderate	Severe
Morden	Neepawa	Tretna
Snowflake	Portage la Prairie	St.James
Dauphin		Stonewall
Carman		Letellier
Gladstone		Morris

Que.-

One report from Sherbrooke County, in which the infections were slight, Himalayan being apparently resistant.

P.E.I.-

Infection slight.

LEAF RUST, caused by
Puccinia simplex (Koern.) Eriks. & Henn.

Alta.-

None observed at Beaverlodge.

Man.-

A trace was found at Winnipeg in 1922, but it was not

observed in 1923.

P.E.I.-
A slight infection in Queens Co.

NET BLOTCH, caused by Helminthosporium teres Sacc.

Alta.-
Very prevalent, at Lacombe being worse on the varieties Stella and Manchurian.

Sask.-
Much more prevalent than usual. In some varieties practically all the fields were attacked.
At Indian Head and Carlyle 50% infections were found, and at Grenfell 25%.

Man.-
Occasional collections were made.

P.E.I.-
Not observed.

SPOT BLOTCH, caused by
Helminthosporium sativum P.K. et B.

Alta. and N.Sask.-
Observed as a head blight, but was not prevalent.

Man.-
In the south-west it was collected in almost every field of barley examined, but there is evidently considerable varietal difference in the plots at Brandon. As high as 70% of the leaf surface was covered in some instances, while nodes and spikelets showed some injury. In the south-east it was fairly general, but light infection.

P.E.I.-
Not observed.

STRIPE DISEASE, caused by
Helminthosporium gramineum Rab.

Alta.-
At Edmonton a few plots showed 2 to 3% infection.

Sask.-
General, but only a small percentage present.

Man.-
In the south-west it was not definitely observed. In the south-east it was less than usual; only occasionally found.

LEAF SPOT, caused by
Rynchosporium secalis (Heins.) Davis

Prevalent at Scott, Lacombe, Edmonton and other districts in northern Alberta. No collections were made in northern Saskatchewan. In southern Saskatchewan, at Indian Head 10% of the plants were affected, in some cases severely. The disease was more severe than last year, but this was probably due to the wet season.

LEAF BLOTCH, caused by Septoria passerini Sacc.

Sask.-
General, but of slight importance.

Man.-
Collected at Boissevain.

Que.-
Reported from Macdonald College as common on the leaves of some varieties, which were unthrifty. It is, however, not troublesome on any variety which is suited to climatic conditions.

ERGOT, caused by Claviceps purpurea (Fr.) Tul.

A trace found at Indian Head, Sask. At Morden, Man., it was common but not severe, about 2% of the plants being affected, with not more than two kernels to a spike ergoted.

POWDERY MILDEW, caused by Erysiphe graminis DC.

The heaviest infection for some years reported from Macdonald College, Quebec.

BACTERIAL BLIGHT, caused by Bacterium translucens J.J. et R.

In south-western Manitoba it was collected frequently early in the season, but apparently did little damage and was totally obscured later by spot blotch.

RYE

STEM RUST, caused by Puccinia graminis Pers.

Man.-
Not observed in either the south-east or south-west of the province.

P.E.I.-
Not observed.

LEAF RUST, caused by Puccinia dispersa Eriks.

Alta.-
General, but not doing any serious damage.

Sask.-
General in northern Saskatchewan, but not resulting in serious damage.

In southern Saskatchewan, at Indian Head, moderate infections were found.

Man.-
Observed at Brandon, Morden, Neepawa and Winnipeg, but not serious.

P.E.I.-
Not observed.

ERGOT, caused by Claviceps purpurea (Fr.) Tul.

B.C.-
Found occasionally.

Alta.-
Much more prevalent than usual in northern Alberta. About 2 to 3% of the heads infected at Edmonton.

Sask.-
Present in northern Saskatchewan but not severe. A 10% infection noted at Indian Head.

Man.-
Loss not great in the south-east; less than usual. In the south-west it was found at Morden, Brandon and Manitou to the extent of 5% at the latter place.

Ont.-
Less than 1% in the Thunder Bay District, a reduction in amount as compared to other seasons.

Que.-
Infection of ½% found at Macdonald College.

N.S.-
A severe infection of 25% in Pictou County.

POWDERY MILDEW, caused by Erysiphe graminis DC.

In Manitoba considerable infection was observed on fall rye, but the damage was negligible. At Macdonald

College, Quebec, the heaviest infection for some years was recorded.

DOWNY MILDEW, caused by
Peronospora trifoliorum de Bary

Quite severe on some plots at Lacombe, Alta.; not observed elsewhere.

SMUT, caused by Urocystis occulta (Wallr.) Rab.

Looked for in Manitoba, but not found.

FORAGE AND FIBRE CROPS

ALFALFA

LEAF SPOT, caused by Pseudopeziza medicaginis (Lib.) Sacc.

B.C.-
The usual amount present, not serious.

Alta. and Sask.-
Present, but not doing any serious damage.

Man.-
In the south-east it was common, but did not cause much damage in the vicinity of Winnipeg, perhaps because of dry conditions.

In the south-west present, less common than the yellow leaf blotch.

Ont.-
Observed on practically all the alfalfa in the Thunder Bay District, but not causing serious injury.

Que.-
One report from Sherbrooke County, where the disease appeared on the second crop, but was not serious.

N.B.-
Very prevalent on lower leaves of all experimental plots.

N.S.-
Of general occurrence at Kentville, with considerable defoliation in places; infection fairly well confined to lower leaves.

P.E.I.-
Present to a small extent.

YELLOW LEAF BLOTCH, caused by
Pyrenopeziza medicaginis Fckl.

This was the most noticeable disease of alfalfa at the Brandon Experimental Farm, Manitoba, this year. The imperfect stage (Sporonema phacidioides) was collected in abundance. It may have caused a small amount of leaf drop. It was also found at Indian Head, Saskatchewan, and Winnipeg, Manitoba.

LEAF SPOT, caused by Pleosphaerulina briosiana Pol.

A new spot was found at the Experimental Farm, Brandon, Manitoba, this year. It is characterized by a white centre with brown to black, slightly raised margin. Black perithecia were visible in the large spots (4m.m. in diameter). Dr. Bisby kindly verified this determination. This parasite has been reported in the United States Plant Disease Survey as occurring in Georgia and other southern states. (I.L. Conners)

LEAF SPOT, caused by Ascochyta medicaginis Bres.

A trace found in south-eastern Manitoba.(Bisby & Bailey)

ROOT ROT or WILT, caused by Sclerotinia sp.

B.C.- Causes considerable damage in the breeding work at Point Grey.

Man.- Some occurred in 1922, but it was not found in 1923.

DOWNY MILDEW, caused by Peronospora Trifoliorum deB.

B.C.-
Occasional along irrigation ditches and wet spots, but as yet of no economic importance. At the Experimental Station at Invermere, one field was found badly affected.

Alta.-
Considerable present in some plots at Lacombe.

Man.-
Considerable present in one field at Winnipeg.

RUST, caused by Uromyces striatus Schr.

In Essex, Ontario, in one field every leaf showed sori up to ten in number. (T.G. Major)

YELLOW LEAF, cause unknown

One report from Point Grey, B.C., where it was present to a considerable extent.

CLOVERS

POWDERY MILDEW, caused by Erysiphe sp.

Sask.-
Common, no perithecia were found.

Man.-
In the south-east considerable occurred again this year and caused some damage. Careful search throughout the summer and autumn failed to reveal a perithecium. There is a marked difference in susceptibility between plants in a field, and resistant strains will probably be obtained. (Bisby & Bailey)
In the south-west it is reported as present, but of

no economic importance.

Ont.-
Reported as being general in Welland, Hastings, Lanark, Carleton, Thunder Bay District, Essex, Kent, Rainy River District. In a report from Harrow the statement is made that the degree of infection on both the first and second crops is apparently increasing.

Que.-
Reported as general and on the increase in Missisquoi, Matane, Sherbrooke and Stanstead Counties.

N.B.-
Common throughout the season, but no perithecia found.

N.S.-
In Colchester and King's Counties, several reports of its general occurrence. In the Annapolis Valley it is reported as present to a very considerable extent on second growth, in some cases stunting the growth somewhat.

P.E.I.-
Moderate infection. Not as severe as last year.

RUST, caused by Uromyces spp.

B.C.-
Present to a considerable extent at Agassiz.

Man.-
Both U. fallens and U. Trifolii occurred but the injury was slight. Aecia of the latter were found on June 1.

Que.-
Reported as slight in Missisquoi and Stanstead Counties.

N.S.-
Reported as general and in some spots severe in Col-

chester and King's Counties.

P.E.I.-
Slight infection.

ROOT ROT or WILT, caused by
Sclerotinia Trifoliorum Eriks.

B.C.-
This disease has been noted at various places in the province, particularly at Point Grey, where the damage was considerable. Great differences in susceptibility between various strains were noted. (P.A. Boving)

Man.-
Some found in 1922, but none in 1923.

P.E.I.-
Not observed.

SOOTY SPOT, caused by
Phyllachora Trifolii (Pers.) Fckl.

In Manitoba this was found on white and red clovers, not so common on the latter. In the Thunder Bay District of Ontario it was found on red clover growing in waste land. Infection was general over plants, but not common in the district as a whole.

LEAF SPOT, caused by
Pseudopeziza Trifolii Fckl.

B.C.-
While fairly prevalent, did not seem to be serious and probably did not influence the yields to any noticeable extent. (P.A. Boving)

Ont.-
One report indicates its presence on the bank of Rainy River, but not a serious infestation.

Que.-
Reports from Missisquoi and Sherbrooke Counties indicate slight infections.

N.S.-
Of general occurrence in Colchester, Kings, Annapolis and Yarmouth Counties, with slight injury.

P.E.I.-
A slight infection in Queen's County.

ANTHRACNOSE, caused by
Gloeosporium caulivorum Kirch.

This disease occurred in the plots of the Agrostology Division at the Central Experimental Farm, Ottawa, 16 to 60% of the plants in these plots being killed. The seed from which these plots was grown was of European origin.

MOSAIC, cause unknown

B.C.-
This is a serious disease at Point Grey and causes much trouble in the breeding work.

Man.-
Some found, but with little apparent damage.

Que.-
One report from Missisquoi County, where it was present to a slight extent.

P.E.I.-
Not observed.

CORN

SMUT, caused by Ustilago Zeae (Beck.) Ung.

Sask.-

One report from Saltcoats, where there was a local infection amounting to 3%.

Man.-

Considerable present, about the usual amount. Infections ranging from 3 to 5% reported from Winnipeg, Brandon, Portage la Prairie and Morden.

Ont.-

Infections ranging from 3 to 7% reported from Harrow, Essex County, Sudbury District, Frontenac, Welland, Leeds and Carleton Counties.

Que.-

Two reports indicating slight infections in Matane and Sherbrooke Counties.

P.E.I.-

Not observed.

RUST, caused by Puccinia Sorghi Schw.

In Manitoba this disease is reported as fairly common, but apparently doing no damage.

EAR and ROOT ROTS, caused by Fusarium spp.

In Manitoba the root rot was not observed, although the perfect stage (Giberella saubinetii) was found on old corn stalks in a wheat field. (Bisby & Bailey) Ear rots, while present in Manitoba, are not common.

FLAX

RUST, caused by Melampsora Lini (Pers.) Desm.

Sask.-
One field of 100 acres in northern Saskatchewan, north of Humbolt, showed very severe infection and in Neville there was a 50% infection.

Man.-
Apparently less than usual. Marked differences in varietal susceptibility. ND114 was injured considerably. (Bisby & Bailey)

P.E.I.-
Not observed.

WILT, caused by Fusarium Lini Bolley

Sask.-
A slight infection noted at Francis.

Man.-
Considerable developed; more than has been reported heretofore. Resistant varieties should be used, especially on old land.

Ont.-
This disease made its first appearance at the Central Experimental Farm, Ottawa, this year, causing extensive injury to 35 one-fortieth acre plots in the breeding work of the Cereal Division. The infection progressed during the season along the lines of surface drainage, apparently indicating a spread by water in the soil.

STEM BREAK, caused by Polyspora Lini Lafferty

Severe in two one-fortieth acre plots at the Agricultural College, Saskatoon, Sask., The determination was made by W. E. Brentzel. Vide Jour. Dept. of Agr. for Ireland, Vol.XXI, No.2, 1921. (W.P. Fraser)

HEAT CANKER (Physiological)

In Manitoba these cankers did considerable injury and were apparently the result of the hot weather in late June and early July. (Bisby & Bailey)
At the Central Experimental Farm, Ottawa, these cankers were observed in June doing considerable damage to the experimental plots of the Cereal Division. (H.T.Güssow)

GRASSES

TIMOTHY (Phleum pratense L.)

RUST, caused by Puccinia graminis Phlei-pratensis Eriks. et Henn.

B.C.-
In other years, this disease has caused considerable injury, but this season the attacks have been less severe. Considerable difference is found between various strains as to their resistance to this disease.

Man.-
Common, but not serious. The rust appears early and must over-winter in the uredinial stage. The following is an approximate distribution of infections:

Moderate	Severe
Portage la Prairie	Dauphin
Neepawa	Snowflake
Edmonton	

Que.-
One report from Sherbrooke County indicates the presence of this disease, but no serious loss.

P.E.I.-
Severe in a few fields; average infection moderate.

LEAF SPOT, caused by
Scolecotrichum graminis Fckl.

Some found in south-eastern Manitoba, but damage slight. (Bisby & Bailey)

LEAF SPOT, caused by
Heterosporium Phlei Gregory

A little of this was found at Winnipeg.(Bisby & Bailey)

SQUIRREL-TAIL (Hordeum jubatum L.)

RUST, caused by Puccinia graminis Pers.

In south-western Manitoba the infection was heavy at the close of the season. Collections were not made, however, until after infection had appeared on wheat.

(I.L. Conners)

The approximate distribution of infections in Manitoba was as follows:

Slight	Moderate	Severe
Elm Creek	Tretna	Morris
Fisher Branch	Letellier	
Simli	Carman	
Purves	Snowflake	
Morden	Wood Bay	
Plum Coulee	Harbor	
Portage la Prairie		

MISCELLANEOUS GRASSES

Puccinia Clematidis (DC.) Lag.

Agropyron tenerum Vasey - Other species of Agropyron, Bromus sp. and Elymus sp. in Saskatchewan. (W.P. Fraser)

Puccinia graminis Pers.

Reported from Manitoba on -

Agropyron Smithii Rydb.
Hordeum jubatum L.
Elymus Macounii Vasey
Agropyron tenerum Vasey
Elymus canadensis L.
Elymus virginicus L.
Agropyron repens (L.) Deauv.
Elymus curvatus Piper
Dactylis glomerata L.

In Saskatchewan severe infections were reported on all susceptible grasses, species not specified.

Puccinia Andropogonis Schw.

Reported from Manitoba on -

Andropogon furcatus Muhl.
Andropogon scoparius Michx.

Claviceps purpurea (Fr.) Tul.

The following hosts and the locality in which they were found, were reported as follows:

Agropyron caninum (L.) Beauv.	Man.
Agropyron dasystachum (Hook.)Scribn.	Sask.
Agropyron repens (L.) Beauv.	Que. & Man.
Agropyron Richardsonii (Trin.) Shrad.	Man.
Agropyron Smithii Rydb.	Man. & Sask.
Agropyron tenerum Vasey	Man.
Bromus inermis Leyss.	Man.
Dactylis glomerata L.	Man.
Elymus Macounii Vasey	Man.
Lolium perenne L.	B.C.
Phleum pratense L.	Man.
Poa pratensis L.	Man.
Spartina cynosuroides (L.) Roth.	Man.
Stipa vividula Trin.	Man.
Scolochloa festucacea (Will'd.) Link.	Man.

Ustilago Agropyri Clinton

Agropyron tenerum Vasey	Man. & Sask.

Ustilago perennans Rostr.

Arrhenatherum elatius (L.) Beauv.	B.C.

Sphacelotheca occidentalis (Seym.) Clinton

Andropogon furcatus Muhl.	Man.

Piricularia grisea (Cke.) Sacc.

Holcus sorghum sudanensis (Piper) Hitchc.	(Sudan grass) Man.

Pseudomonas sp.

Holcus sorghum sudanensis (Piper) Hitche.	(Sudan grass) Man.

MILLET

SMUT, caused by Sorosporium Syntherismae (Peck) Farl.

Specimens of this disease were forwarded from Lacombe, Alta. It was not seen elsewhere. (W.P. Fraser)

SUNFLOWER

RUST, caused by Puccinia Helianthi Schw.

Alta.-
Collections were made in this province.

Sask.-
General in northern Saskatchewan. A slight infection at Indian Head.

Man.-
In the south-west it was present in the experimental plots at Brandon, doing little damage. At Morden it was severe, affecting 65% of the leaves. A row of sunflowers at Brandon used as a windbreak around a flower garden, had 100% of the leaves infected, with numerous lesions on the petioles and stems. Rust on wild sunflowers was also noted. (I.L. Conners) In the south-east it was common and caused some defoliation, but was not serious.

Ont.-
Present at the Central Experimental Farm, Ottawa, but not serious.

Que.-
Present at Macdonald College, but not as common as last year.

P.E.I.-
Not observed.

WILT or DROP, caused by *Sclerotinia* sp. probably *libertiana*

B.C.-

At Point Grey it has not caused extensive damage, but in certain parts of the interior, both around Kamloops and in the Okanagan, the losses have been considerable.

(P.A. Boving)

A sample of seed was sent to the Central Laboratory, Ottawa, from Quilchena, containing large numbers of sclerotia, some being of a shape which would conform to the spaces between the seeds on the head. Seed contaminated in this way would be difficult to free from sclerotia, because of the general similarity of shape and size to that of the seed. Plants from seed of this kind would have little chance of escaping infection. (F.L. Drayton)

Alta.-

One or two diseased plants found at Lacombe. Not observed elsewhere.

Man.-

Some occurred; probably the worst sunflower disease this year. In a windbreak at Brandon 50% of the plants were affected.

Ont.-

Present at the Central Experimental Farm, Ottawa, but not to the same extent as last year.

Que.-

Present for the first time in Arthabasca County, a small amount.

P.E.I.-

Infections of this disease on the increase; 75% infection noted in one field.

POWDERY MILDEW, caused by
Erysiphe cicoracearum DC.

Common late in the season in Manitoba, causing little or no damage.

DOWNY MILDEW, caused by
Plasmopara Halstedii Farl.

Present to a small extent at the Central Experimental Farm, Ottawa.

LEAF SPOT, caused by Septoria Helianthi E. et K.

Some found at Winnipeg and Morden, Manitoba.

GREY MOULD, caused by Botrytis sp.

Found attacking the leaves and growing points of several varieties at Lacombe, Alta.

CHLOROSIS, cause unknown

Very marked on about 25% of the plants at the Experimental Farm, Scott, Saskatchewan.

SWEET CLOVER

STEM CANKER, caused by Ascochyta caulicola Lau.

This disease was present at Olds, Alta., and Saskatoon, Sask. (W.P. Fraser) At the former place, about 2% of the plants in the plot examined were completely killed

and about 6% affected, causing a total loss of 5% (H.S. MacLeod). This disease has also been found at Indian Head, Sask., and in Manitoba, but has never before been reported from Western Canada.

MOSAIC, cause unknown

Common in the vicinity of the Experimental Station at Summerland, B.C. In Manitoba it is sometimes found.

STEM ROT, caused by Botrytis sp.

One sweet clover cover crop in the Summerland district, B.C., was found to be dying off with a stem rot due to a Botrytis sp.

FRUIT DISEASES

APPLE

SCAB, caused by Venturia inaequalis (Cke.) Wint.

B.C.- Coast and Kootenay -
Severe in the Kootenays. Unsprayed McIntosh showed 100% infection in some localities. Northern Spy and Newtown also showed high infection. McIntosh sprayed four times showed 10 to 25% infection in some cases, especially along the Arrow Lakes. In the Creston Valley, the most important apple producing area in this section, spraying resulted on the whole in satisfactory control. At the coast, this disease was more prevalent than last year, but not generally severe.

Okanagan and Salmon Arm -
Owing to an unusually wet spring, infection was quite general and more severe than formerly, except in southern Okanagan, Grand Forks, Creston and Keremos. In many orchards where no spraying was carried out, practically all apples were unmarketable. In Agassiz scab was not as abundant as usual.

Man.-
Common, but not serious.

Ont.- Frontenac Co. -
All orchards of Snows and McIntosh affected to the extent of 75% with 25% reduction in value. Where Bordeaux mixture was used, there was little damage.

Thunder Bay District -
General, but not causing much damage.

Essex Co. -
Observed on all unsprayed trees.

Niagara District -
Not as prevalent as last year.

Que.-
Where the ordinary spray schedule was carried out, this disease was completely controlled.

N.B.-
One orchard in King's County showed 20% leaf and 35% fruit infections on McIntosh. Baldwins in the same orchard had less than 1%. Considerable difficulty was experienced by growers in getting efficient control with spray schedules at present recommended. Some heavy infection reported on McIntosh and Dudley in York County. Unsprayed orchards showed up to 100% on leaf and fruit. (Hockey and Richardson)

N.S. -Annapolis -
This was the only apple disease which did not show a marked decrease in prevalence during 1923, being somewhat more abundant.

King's Co. -
Infections ranging from 2 to 7%.

Cumberland Co. -
Bad in most varieties. McIntosh were very bad this year, even though sprayed three times with lime sulphur and arsenate of lime.

Hants Co. -
Infection averaged 3 to 5%; severe where orchards are not well sprayed.

Pictou Co.-
Most of the orchards in the eastern section of the

county are small and uncared for. All varieties badly infected. Fruit fit only for local market and home consumption.

P.E.I.-
Only a slight amount present this year

BLACK ROT, caused by Physalospora Cydoniae Arn.

Man.-
Common on leaves and in some cases severe at the Morden Experimental Station. Cankers were rare, and the damage slight.

Ont.-
Reported from Essex County and the Niagara District; not serious in either locality.

Que.-
In Sherbrooke County it is general and serious. In Bonaventure County many of the trees are more or less affected, but the trees are not sprayed.

N.S.-
Reported as present in Annapolis, Digby, King's and Hants Counties, causing considerable leaf injury and some cankers.

P.E.I.-
Not observed.

JUNIPER RUST, caused by
Gymnosporanguim Juniperi-virginianae Schw.

Ont.-
Only one or two cases found in the Niagara District; unimportant.

N.S.-
Generally of a minor nature, present to a lesser extent than last year.

FIRE BLIGHT, caused by *Bacillus amylovorus* (Burr.) Trev.

B.C.- Coast and Kootenay -
The only new infections observed were in the neighbourhood of Cranbrook, E. Kootenay, where it was severe.

Okanagan and Salmon Arm -
Twig blight was serious in orchards neighbouring pear orchards where the disease was severe.

Man.-
Fairly general, but not severe. Apparently less than usual.

Ont.-
In the Niagara District as high as 50 to 70% of Tolman blossom spurs were destroyed. Baldwin and Spy are somewhat more susceptible than other varieties. On the average, with most varieties, about 20% of blossom spurs affected. However, the disease in this neighbourhood does not appear to have done more than destroy the fruit spurs.

In Ottawa and the vicinity the disease was prevalent and destructive.

In Renfrew County, 50% infections are reported. Specimens of this disease were also received from Aylmer and Sombra townships.

Que.-
Slight infections reported from Champlain, Matane, St.Lambert and L'Islet Counties.

P.E.I.-
Not observed.

ANTHRACNOSE, caused by
Neofabraea malicorticis (Cord.) Jack.

Three reports from British Columbia indicate the presence of this disease in the Salmon Arm District, Agassiz and on the coast, particularly in unsprayed orchards.

EUROPEAN CANKER, caused by Nectria galligena Bres.

This disease was not observed in the Niagara District or in Prince Edward Island, but in Nova Scotia it is reported as being associated with the green apple bug and having increased this year.

POWDERY MILDEW, caused by
Podosphaera leucotricha (E. et E.) Salm.

Two reports from British Columbia which indicate general infections, but not severe except in isolated places. Not severe enough, as a rule, to justify the expense of spraying.

SOOTY BLOTCH, caused by
Leptothyrium pomi (Mort. et Pr.) Sacc.

Generally of a minor nature in Nova Scotia and present even to a lesser extent than usual this year.

CANKER, caused by Nectria sp.

In British Columbia the cankers caused by this disease occurred on most of the trees that have suffered from winter injury.

SILVER LEAF, caused by Stereum purpureum Pers.

This apparently becomes more common each year in Man. Slight infections were found in Prince Edward Island. "In British Columbia a silvery sheen on the foliage was present in many orchards. No fruiting bodies of the fungus were found. It is considered that this appearance is due chiefly to a certain type of root injury." (H. R. McLarty)

NON-PARASITIC DISEASES

BITTER PIT

Prevalent in practically all districts in the Okanagan and Salmon Arm section. In Nova Scotia it is generally of a minor nature and present even to a lesser extent this year than in previous years.

COLLAR ROT

During the past year, this disease has attracted a great deal of attention in British Columbia. In some orchards the loss was approximately 15% of the trees. It is considered that frost injury accounts for the major part of the damage. In only a few cases have the rhizomorphs of Armillaria mellea been present on decayed roots. (H. R. McLarty)

WINTER INJURY

In British Columbia a considerable amount of injury occurred in some orchards. This was most severe in

the Salmon Arm District, where heavy fall rains after a dry summer, prevented early maturing of the trees.

CORKY CORE

This was reported last year as Core Rot, the name having been changed on the suggestion of Dr. C. Brooks of the United States Department of Agriculture.

In British Columbia this disease was practically absent from the Salmon Arm District this year, but was present in many orchards scattered throughout the Okanagan. Losses sustained in some instances were 30 to 40% of the crop.

DROUGHT SPOT

General in all parts of British Columbia, particularly in orchards in light soil. The losses sustained this year were not as high as formerly.

APRICOT

SILVER LEAF (non-parasitic)

A silvered appearance to the foliage occurred in the Naramata District of British Columbia. The cause was considered to be a type of root injury.

BLACKBERRY

ORANGE RUST, caused by *Gymnoconia interstitialis* (Schl.) Lag.

In the Niagara District this is the principal disease of the blackberry, and with many growers is the largest factor against the culture of this berry. It is wide-

spread and varies from 1 to 25%.

In Hull County, Quebec, and York and Sunbury Counties in New Brunswick, it is plentiful on wild blackberries from June 20 to July 15. A 100% infection in many roadside patches was common. None was found on cultivated varieties.

CHERRY

SHOT HOLE, caused by *Coccomyces hiemalis* Higgins.

In the Niagara District it was not destructive in sprayed orchards, but otherwise caused considerable July and August defoliation.

In Digby County, Nova Scotia, both sweet and sour cherries showed considerable infection and some slight defoliation.

BROWN ROT, caused by *Sclerotinia cinerea* (Bon.) Schr.

B.C.- Present in the coastal area. Little on the fruit, but the blossom blight on Olivet cherries at Gordon Head seemed to have extended its area, while the severity was equal to that of last year, when 10 to 75% of the blossoms were destroyed. Infections were also reported from Agassiz and Balfour.

Man.- Present to a limited extent on all sour cherry varieties at Morden.

Ont.-

Blossom blight was very bad in the Niagara District, some orchards showing 75% of the blossoms destroyed, while sprayed orchards on dry soil showed up to 10%. This loss, however, was not serious, owing to the abundance of blossoms. The disease was not troublesome during the rest of the season.

N.S.-

Somewhat more abundant than usual.

CURL, caused by Taphrina Cerasi (Fcl.) Sad.

In British Columbia it occurs at points in the Fraser Valley, but not in commercial orchards. At Summerland one tree at the Experimental Station was quite severely injured.

It was scarce in the Niagara District of Ontario.

POWDERY MILDEW, caused by
Podosphaera Oxyacanthae (Fr.) deB.

In British Columbia it was quite common on young trees, but the damage was not unusually severe. In the Niagara District, Ontario, it was practically absent.

BLACK KNOT, caused by
Plowrightia morbosa (Schw.) Sacc.

B.C.-

Specimens of this disease were brought in by Mr. W. Anderson from an orchard on the Indian Reserve at Point Grey. This is the second case reported on cultivated cherries or plums in British Columbia.

the other being at Kerrisdale, near Vancouver.

Man.- Small amount present at Morden.

Que.- Not common on cultivated varieties, but severe on wild cherries and plums.

P.E.I.- Slight infections reported.

BLIGHT, caused by Coryneum Beijerinckii Oud.

At the University of Saskatchewan it was severe on the leaves of cultivated sand cherries.

BREAK DOWN (non-parasitic)

Cherries from the Okanagan, British Columbia, broke down badly in shipments. Examination of such cherries failed to show the presence of any one fungus. It is considered that the tissues were unusually weak, due to different climatic conditions that prevailed this season. (H. R. McLarty)

CURRANT

RUST, caused by
Cronartium ribicola F. de Wald.

See under WHITE PINE.

LEAF SPOTS, caused by
(Pseudopeziza Ribis Kleb.
(Mycosphaerella Grossulariae Lag.

B.C.- Generally present from East Kootenay to the coast. Defoliation occurred in some cases, but usually of

little consequence. It is also present in the Salmon Arm District, but not causing serious damage.

Alta.-
Of common occurrence. Severe at Lacombe.

Sask.-
Common in northern Saskatchewan. Severe at Indian Head and Scott.

Man.-
In the south-west blacks and reds were heavily infected. A similar leaf spot (Mycosphaerella amea) was present on flowering currants, prematurely defoliating some of the bushes. In the south-east it was common, but not serious.

Ont.-
Present in the Thunder Bay District and Niagara Peninsula, but not doing any damage.

Que.-
One report of slight infection in Sherbrooke County.

N.B.-
Average infection of 10% found on red and black varieties in Westmoreland County.

N.S.-
Reported from Cumberland, Colchester, Pictou, Antigonish and Hants Counties.

P.E.I.-
Only moderate infection this year.

RUST, caused by Puccinia Pringsheimiana Kleb.

Reported from Deloraine, Morden and Winnipeg, Manitoba, also from the Niagara District, Ontario, but not serious.

POWDERY MILDEW, caused by
Sphaerotheca mors-uvae (Schw.) B. et C.

Present generally in British Columbia, in some cases the loss being great. Severe on black currants in Saskatchewan. Collected also at Lacombe, Alberta. In the Niagara District, Ontario, it was not observed this year.

CANE BLIGHT, caused by
Nectria cinnabarina (Tode) Fr.

This is reported from south-eastern Manitoba as being sometimes found on injured canes.

GOOSEBERRY

LEAF SPOTS, caused by Mycosphaerella Grossulariae Lag. and Pseudopeziza Ribis Kleb.

B.C.- Generally present from East Kootenay to the coast. Defoliation occurred in some cases, but usually of little consequence.

Sask.- Quite severe at Scott. Defoliation of shrubs showing.

N.B.- Average infection of 3% in patches examined in Westmoreland County.

N.S.- A general infection reported from Colchester County.

P.E.I.- Moderate infection, causing little injury.

RUST, caused by Puccinia Pringsheimiana Kleb.

Man.-
Did some damage at Morden.

Que.-
A slight infection reported from Kamouraska County.

N.B.-
Slight infection of aecial stage found on patches in Westmoreland County.

N.S.-
One specimen received from Kentville in June.

POWDERY MILDEW, caused by
Sphaerotheca mors-uvae (Schw.) B. et C.

B.C.-
Severe on English varieties at the coast.

N.B.-
One patch in Westmoreland County had 75% of the plants affected, many plants showing 100% on the growing tips. Other patches which were interplanted with strawberries that received early applications of sulphur dust showed only 5% of plants with slight infections.

N.S.-
In Cumberland County infections ranging from 15 to 30% were reported.

GRAPE

BLACK ROT, caused by
Guignardia Bidwellii (Ell.) V. et R.

One report from the Niagara District, Ontario, indicates that it is general, but less injurious than usual owing to the fairly dry season.

DOWNY MILDEW, caused by
Plasmopara viticola (B. et C.) Berl. et de Toni

Unimportant in the Niagara District, only a few cases being observed.

POWDERY MILDEW, caused by Uncinula necator Schw.

Not as abundant as usual in the Niagara District.

DEAD ARM, caused by
Cryptosporella viticola (Red.) Shear.

Fairly general throughout the Niagara District. Heavy pruning is being successfully employed by growers as control. About 5% of the vines were affected in some patches.

PEACH

CURL, caused by Taphrina deformans (Fcl.) Tul.

B.C.- Present in many orchards where no spray was applied, and the loss was severe in some cases.

Ont.- In the Niagara District 50 to 80% infection occurred in unsprayed orchards. Spraying resulted in good control. The disease was general all over the peninsula on unsprayed trees; however, on the whole it was efficiently controlled.

At Harrow, it was observed in some orchards.

N.S.- Slight infection in King's County.

POWDERY MILDEW, caused by Sphaerotheca pannosa (Wal.) Lev.

In British Columbia slight infections are common, but severe damage is not incurred. In the Niagara District infections are scarce and unimportant.

BROWN ROT, caused by Sclerotinia cinerea (Bon.) Schr.

Common in Ontario, but is of no great importance economically this year. This disease is usually not as severe on peaches as it is on cherries.

SCAB, caused by Cladosporium carpophilum Thüm

In the Niagara District it is common and causes reduction in marketable quality of some varieties, especially St.John, Elberta and Smock. This disease is apparently becoming more troublesome,and numerous growers are enquiring about methods for its control. Spraying for this disease has not usually been considered economical in this district. As a general rule peach trees receive only a dormant spray for leaf curl.

(Berkeley and Jackson)

NON-PARASITIC DISEASES

LITTLE PEACH

Very uncommon in the Niagara Peninsula; odd trees here and there were marked for eradication by provincial authorities. One orchard at Grimsby had about six such trees.

DROUGHT SPOT

In British Columbia a spotting of the fruit occurred in many orchards. Examination showed the absence of any fungus. The Provincial Entomologist stated that the injury was not due to insects. Examination of the root systems of affected trees showed extensive injury to the fibre roots. (H. R. McLarty)

PEAR

FIRE BLIGHT, caused by *Bacillus amylovorus* (Burr.) Trev.

B.C.-

In general the infections were more severe than in 1922. In many orchards the losses were extremely heavy, and only by the most vigorous campaign of cutting was the disease kept at all in check. An unusually wet spring accounted, no doubt, for its increased severity. In a survey of the Creston District it was found in one orchard. This is a reappearance of the disease in this district after being reported free for four years. (H. R. McLarty)

Ont.-

The pear crop was light, being chiefly due to fewer blossoms being present, but partly to the presence of blossom blight, with destruction of the fruit spurs. Pear orchards generally in the Niagara Peninsula appear to be holding their own well against the disease. However, in some orchards it has been exceptionally

severe this year, in many cases killing trees outright.

Que.-

In Kamouraska County, in a young orchard of about twenty trees, the four Clapp's Favourite were affected. One tree was entirely affected, the others only at the top, but the main stem ultimately died down to within one foot of the ground. (H. N. Racicot)

SCAB, caused by Venturia pyrina Aderh.

B.C.-

More than last year at the coast. Unsprayed Bartletts showed 75% infected fruits in certain cases. Unsprayed Flemish Beauty showed 100%. At Agassiz it was present to some extent this year, but not nearly as bad as in 1922.

Ont.-

In the Niagara District it was general throughout, but not enough to make it of economic importance. In Halton County quite heavy infection on Flemish Beauty is reported, with considerable damage incurred.

DROUGHT SPOT (non-parasitic)

An injury similar to the drought spot of apple has occurred in several orchards in southern Okanagan. The causes are considered to be the same as those in the apple. (H. R. McLarty)

PLUM

BROWN ROT, caused by Sclerotinia cinerea (Bon.) Schw.

B.C.- Abundant and causing heavy loss in Agassiz and Mission. Grand Duke is apparently not so susceptible.

Man.- The first report of this disease at the Agricultural College, Winnipeg, was in 1922, where there was considerable present. Three plums only were found in 1923. Mr. Leslie at the Morden Experimental Station writes that it is common there on hybrids with Sand cherry as a parent and on plums with considerable Prunus triflora blood. He finds the pure native plums to be immune. (Bisby and Bailey)

Ont.- There was a bad attack in the Niagara District just after the fruit was set, due to a period of wet weather, but this only served to thin the set of plums, which was too heavy. Spraying prevented any further spread and the disease was not troublesome later. (Berkeley and Jackson)

Que.- Not observed this year at Macdonald College even in orchards which showed considerable infection last year.

N.S.- Some specimens were received from River John.

P.E.I.- Not observed.

SHOT HOLE, caused by Coccomyces prunophorae Higgins.

Sask.-
Moderately severe at Scott.

Man.-
Occurs occasionally.

Ont.-
Common in unsprayed orchards in the Niagara District, several of which were observed to be losing their leaves late in July and August. Thorough spraying appears to be necessary. Early varieties were especially susceptible. (Berkeley and Jackson)

Que.-
In one orchard in Kamouraska County, two trees out of twenty were almost wholly defoliated. In Sherbrooke County there was a serious infection.

P.E.I.-
Not observed.

PLUM POCKETS, caused by
Taphrina Pruni (Fcl.) Tul.

Sask.-
A few specimens observed at Rosthern, Indian Head and Canora. Not observed elsewhere.

Man.-
Common and often serious. Controlled by dormant wash and pink bud Bordeaux at the Agricultural College, Winnipeg.

Ont.-
Specimens sent from Snake Creek and Cardinal. Fairly general and serious throughout the province.

Que.-
Severe infections reported from Hull, Sherbrooke, and

Champlain Counties.

N.S.-
In King's County 5% infections noted.

BLACK KNOT, caused by
Plowrightia morbosa (Schw.) Sacc.

Man.-
Common and often injurious.

Ont.-
Scarce in the Niagara District, because of thorough spraying and pruning.

Que.-
One report from Bonaventure County which indicates all trees badly affected, none of them being sprayed or pruned.

N.B.-
Found generally on the majority of native plums and wild cherries. Many old trees are heavily infected.

N.S.-
Heavy infections reported from King's and Colchester Counties.

SCAB, caused by Cladosporium carpophilum Thüm

Man.-
Collected on cultivated plums at Brandon. It seriously affects the appearance of the fruit.

Que.-
A shot hole disease was caused by this fungus at Macdonald College, the trees being 100% infected. The trees appeared quite brown at a distance and many branches of some of them were completely defoliated.

QUINCE

LEAF BLIGHT, caused by Fabraea maculata (Lev.) Atk.

In the Niagara District this disease is common and doing considerable damage where spraying is neglected.

RUST, caused by
Gymnosporangium germinale (Schw.) Kern.

Present in the Niagara District, but not of great importance. The number of quince trees grown is limited.

RASPBERRY

SPUR BLIGHT, caused by
Mycosphaerella rubina (Pk.) Jacz.

Man.-
This disease is not uncommon.

Ont.-
Its presence is noted generally, but it is apparently of little economic importance.

Que.-
Some damage was done by this fungus on Herberts at Macdonald College.

N.S.-
More or less severe in garden patches in Colchester Co.

ANTHRACNOSE, caused by Gloeosporium venetum Speg.

Ont.-
Small infections in the Thunder Bay District. In the Niagara Peninsula it is scarce except on black raspberries and blackberries.

Que.-
Slight infections reported from L'Islet, Champlain and Matane Counties. At Macdonald College there was a 90%

infection of the Herberts.

N.B.-
An average infection of 25% on young canes at Fredericton in variety plots. Slight infection in commercial patches.

P.E.I.-
A small percentage found.

CANE BLIGHT, caused by
Leptosphaeria coniothyrium (Fckl.) Sacc.

Infections reported from Sherbrooke County, Quebec, and Colchester County, Nova Scotia.

CANE DISEASE, probably caused by
Acrostalagmus caulophagus Law.

In the Niagara District this year a cane disease has been prevalent. Plantations with infections as high as 10% have been observed. Three-quarters of the plantations show the presence of the cane disease. As yet it is not certain what proportion of this is due to cane blight (Leptosphaeria coniothyrium (Fckl.) Sacc.) and what percentage is due to blue stem (Acrostalagmus caulophagus Law.). Internal isolations from five different plantations have in most cases given blue stem cultures from red as well as black raspberries. Observations in the field also show that the bulk of this disease may be blue stem. In any case it is important to note that blue stem has been found this year on red raspberries. Last year it was reported on black raspberries only.

LEAF SPOT, caused by Mycosphaerella Rubi Roark.

Slight injury has been caused by this disease in Manitoba.

CROWN GALL, caused by Bacillus tumefaciens E.F.S.

B.C.-

It seems to be increasing in frequency on red raspberries. So far only reported from Vancouver Island and the Fraser Valley.

Ont.-

Fairly common, but of no great importance in the Niagara District. A specimen sent from Markham.

P.E.I.-

Observed affecting a few patches; not severe.

MOSAIC, cause unknown

B.C.-

A very severe case was found at Nelson, and it was noticed at points in the Fraser Valley. In most cases it does not seem to have appreciably affected the productivity of the plantations. In the Okanagan and Salmon Arm Districts it is noticed in practically all the plantations. Infection seems general, particularly in the Salmon Arm District, where there are plantations of considerable size.

Man.-

Common and rather serious.

Ont.-

Infection of 10% noted in Essex County. Serious in the Thunder Bay District and common on the wild raspberries.

This disease is general throughout the Niagara Peninsula, Lake Ontario and Milton Districts. Young plantations average about 10% and older plantations about 15 to 20%. Many of the worst patches have been removed because of being unprofitable, and certified stock is adding to the number of reasonably clean patches. Growers are becoming acquainted with the disease, and by doing their own rogueing, and having started with good stock, are working out a practical control. Some growers report almost a normal crop from patches having a high percentage of disease, but unless highly fertilized, such patches are proving unprofitable. A few cases of rapid rate of spread were observed this year, but in general the spread of the disease does not appear to have been as great as in 1922.

Que.-

At Ste.Anne de la Pocatiere some plants were affected at the Experimental Station, less than 1%. An infection of medium intensity is reported from Sherbrooke.

N.B.-

Common on wild Rubus sp. Among cultivated varieties, St.Regis, Herbert and Eldorado were the only ones

found free from mosaic. Other varieties had from 1 to 50%, except Marlboro, which showed approximately 90%.

N.S.-
Of fairly general occurrence, but not doing much apparent damage.

P.E.I.-
Severe in some patches, while not present in others. It is spreading slowly.

LEAF CURL, cause unknown

Man.-
Sometimes found.

Ont.-
Causes considerable annual loss, from 1 to 5%, due to the removal of diseased plants. Continual rogueing by the growers, however, is keeping the disease from becoming more serious. A certain amount reappears every year due to spread and to incomplete removal of the large root system of the rogued plants, but the disease is decidedly on the decrease.

Que.-
One report from Sherbrooke indicating a medium infection. Newman No.24 and King are apparently resistant.

N.B.-
Commonly found in patches of wild raspberries. Cultivated patches have very low percentage. Where found, the disease appears to have been present for several years, both in wild and cultivated patches.

N.S.-
One report from Nappan Experimental Farm shows 15% infection in Herberts and 5% in Newmans.

P.E.I.-
Severe in a few varieties, but generally not bad.

STRAWBERRY

LEAF SPOT, caused by Mycosphaerella Fragariae (Schw.) Lin.

B.C.-
About the usual amount present. A disease of little importance.

Alta.-
Observed in various places in northern Alberta.

Sask.-
Present at Saskatoon, Rosthern and Scott.

Man.-
Common and causes some damage.

Ont.-
Reported from Essex County, Thunder Bay and Niagara Districts as present in almost every patch, but apparently of not great economic importance.

Que.-
Some damage from this disease is reported from L'Islet and Sherbrooke Counties. Valeria and Portia show some resistance.

N.B.-
Average infection of 60%, but there was little defoliation and not much damage.

N.S.-
Reports from Nappan and Kentville indicate slight infections. "In Annapolis County it was noticeable

on various patches. It is interesting to record that areas dusted or sprayed with Bordeaux for the control of strawberry weevil contained much less leaf spot than the patches not so treated, also, where sulphur compounds were used, control was noted, but not to the same extent as with the Bordeaux." (A. Kelsall)

P.E.I.-
A small percentage present.

LEAF SCORCH, caused by
Mollisia earliana (E. et E.) Sacc.

Ont.-
At Whitby a serious infection is reported. Not as prevalent as leaf spot in the Niagara District, being of no economic importance.

N.B.-
Slight infection up to 5% reported in Westmoreland Co.

POWDERY MILDEW, caused by
Sphaerotheca Humuli (DC.) Burr.

Ont.-
Especially severe in some plantations in the Niagara District, causing a curling and drying up of the leaves. One grower estimated a loss of one-third of his crop.

N.B.-
One patch of seven acres in Westmoreland County had 30% infection on foliage. Other patches in vicinity totaling seventy-five acres had practically no mildew. One severe infection reported in King's County, where a one-acre field of Sample variety had 90% foliage

infection and 50% fruit infection on both green and ripe fruit (August 4). The following estimates were made July 18 on the variety plots at the Experimental Farm, Fredericton:

Americans	100%	Warfield	10%
Beans	100%	Glen Mary	5%
President	80%	New York	5%
Sample	75%	Buback	3%
Williams Improved	75%	Brandywine	2%
Parson's Beauty	60%	Charles 1	2%
Betty Sunday	50%	Jersey Giant	slight
Ozark	25%	Julia	slight
Senator Dunlap	25%	Bewasteco	slight
K. Prize	25%	Vovania, Ohelio, Viola,	
Black Beauty	15%	Portia, K.Premier, Splendid	
Cordelia	10%		0%
Bederwood	10%		

N.S. -
One report from Kentville indicates a severe infection on the variety President, with a trace on others.

P.E.I.-
Average infection of 6%.

FRUIT ROTS, caused by Botrytis and Rhizopus spp.

Man.-
Present to about the usual extent.

N.B.-
Average report of 4% infection on fruit during first week in August. Later pickings developed up to 15% fruit infections.

N.S.-
One report from W. L. Blair, Kentville, N.S., stated that considerable rot was noticed on heavily fertilized beds where foliage was dense. Location and variety seemed to bear little relation to prevalence of disease in such patches.

ROOT ROT, cause unknown

N.B.-

In a survey of several patches of strawberries in Queens, Kings and Westmoreland Counties, the following percentage infections are recorded:

Senator Dunlap	¼ acre	2 yr.	15%
" "	2 acres	3 yrs.	50%
" "	1 acre	2 yrs.	50%
" "	1 "	1 yr.	2%
Sample	¼ "	3 yrs.	75%
"	2 acres	2 "	2%
Senator Dunlap	40 "	1-3 "	8%
" "	50 "	1-3 "	2%

The disease is more or less localized in the Grand Lake District and at Fredericton on the variety plots. The disease appears to be of bacterial origin.

P.E.I.-

Found to the extent of 5% in some patches.

VEGETABLE AND FIELD CROP DISEASES

ASPARAGUS

RUST, caused by Puccinia Asparagi DC.

In Manitoba this disease was observed, but no damage noted. In Prince Edward Island it has not yet been observed.

RUSTY TIPS, cause unknown

A trouble apparently similar to that noted in the East, in the last annual report, under this name, was observed on Vancouver Island.

BEAN

ANTHRACNOSE, caused by
Colletotrichum Lindemuthianum (Sacc. et Magn.) Br. et Cav.

Alta.-
Present, but not very prevalent.

Sask.-
Collections made at Saskatoon, Rosthern and Indian Head.

Man.-
Trace found at Morden. At Brandon it was more destructive than bacterial blight. Challenge Black Wax was apparently heavily infected in 1922 and showed 100% of the plants affected. After one rain the infection on this variety increased to 75% of the pods. All varieties showed more or less of the disease except Canadian Wonder.

Ont.-
One report from Halton County, where there was a

heavy infection.

Que.-
Moderate infections reported from Sherbrooke County, Missisquoi County and Macdonald College, Hodson Long Pod, Stringless Green Pod and Refugee showing some resistance.

N.B.-
Not of much importance except in a few localities, and there only to a small extent.

N.S.-
In Annapolis County it was less prevalent than usual. At Nappan Experimental Farm the following infections of varieties were noted:

Stringless Green Pod	30%	Wardwell's Kidney Wax	30%
Round Pod Kidney Wax	30%	Ex.Early Red Valentine	25%
Plentiful Fruit	75%	" " Round " "	15%

P.E.I.-
Severe infections in certain localities.

BACTERIAL BLIGHT, caused by Bacterium Phaseoli E.F.S.

Alta.-
Prevalent in the irrigated districts of Lethbridge, Vauxhall and Brooks.

Sask.-
Present in northern Saskatchewan, but not severe.

Man.-
In the south-east it was common and somewhat injurious. In the south-west it caused a loss of 5-10% of the surface. Many of the pods were also infected, principally along the suture and through insect punctures, although stomatal infection also occurred, but to a more limited

extent. This disease is evidently not spread by rain to the same extent as anthracnose.

Que.-
At Farnham, 25% of the plants in six plots were affected. At Macdonald College this disease was not as serious as anthracnose, but caused a good deal of damage.

N.S.-
A number of farmers' gardens showed infections ranging from moderate to severe.

P.E.I.-
Two reports indicate local infections ranging from 50% to 100% loss.

RUST, caused by Uromyces appendiculatus (Pers.) Lev.

N.S.-
Appeared late in the season and was fairly abundant on pole beans.

P.E.I.-
Severe infections noted in a few instances.

WILT, caused by Sclerotinia libertiana Fckl.

Moderate infection of about 10% noted in variety plots at Fredericton, N.B.

RHIZOCTONIA, caused by
Corticium vagum B. et C.

In the district of Raymond, Alta., this disease affected many bean crops. In some cases the loss would be as high as 10%. It was also observed at Vauxhall, Alta., on July 28.

MOSAIC, cause unknown

Man.-
Slight infection at Morden.

Ont.-
In Essex Co., 25% of the plants in several small plots were affected. In the Niagara District it was common, some plots showing a high percentage.

Que.-
Present to a small extent in Champlain Co.

P.E.I.-
Not observed.

BEET

LEAF SPOT, caused by Cercospora beticola Sacc.

Man.-
Occasional infections, but no damage.

Ont.-
One report indicating its presence in the Thunder Bay District, not causing much damage.

Que.-
General in Sherbrooke Co., but not serious.

N.S.-
General in garden plots in Kings, Digby and Colchester Counties, but injury very slight.

P.E.I.-
Slight infections.

SCAB, caused by
Actinomyces scabies (Thax.) Güssow

A few isolated cases reported from Rimouski Co., Que.

Fairly common in Ontario.

ROT, caused by Phoma Betae Fr.

This disease did some damage on Lulu Island and at Duncans, B.C. Phoma Betae was isolated in both cases, but there was evidence that a considerable amount of dry rot could exist without any fungus being found, cultures from the tissue remaining sterile. The season at the places mentioned was exceptionally dry.(J.W.Eastham)

CABBAGE

CLUB ROOT, caused by
Plasmodiophora Brassicae Wor.

Que.-
Two reports from Champlain Co. indicate its presence to a moderate extent.

N.B.-
Very little reported.

N.S.-
At Nappan Experimental Farm Extra Amager Danish Ball-head was 6% infected.

SOFT ROT, caused by Bacillus carotovorus Jones

B.C.-
After a wet period in July, soft rot occurred in practically all cabbage gardens from Kelowna south. The damage was quite severe on the outer leaves. Dry weather following this period checked the advance of the disease.

Man.-
Moderate damage occurred from this disease.

CAULIFLOWER

SOFT ROT, caused by Bacillus carotovorus Jones

One report from Manitoba, where this disease was found causing moderate damage.

CELERY

LATE BLIGHT, caused by
Septoria Petroselini Desm. var. Apii Br. et Cav.

Ont.-
In Frontenac County it reduced the value of the crop by 50%, Paris Golden being more severely attacked than the other varieties. One farm near Toronto had a 40% infection with considerable damage. In Peterborough County and the Thunder Bay District infections were also noted doing some damage.

Que.-
Present at Macdonald College and in Sherbrooke County, but not as common as last year. Paris Golden was found to be more susceptible than Easy Blanching.

EARLY BLIGHT, caused by Cercospora Apii Fr.

One report of a slight infection at Macdonald College in September.

SOFT ROT, caused by Bacillus carotovorus Jones

B.C.-
At Summerland some damage was caused, and was occasionally present at Agassiz.

Man.-
Moderate damage incurred.

CUCUMBER

WILT, caused by Bacillus tracheiphilus E.F.S.

One report from a greenhouse in Essex Co., Ont., where there was a moderate infection.

MOSAIC, cause unknown

Man.-
This was first found this year, causing much loss, in the trucking area north of Winnipeg.

Ont.-
Present in Frontenac Co.

P.E.I.-
A small amount on one variety.

HORSE RADISH

LEAF SPOT, caused by
Cercospora Armoraciae Sacc.

One garden badly diseased at Lacombe, Alta.

LETTUCE

DROP, caused by Sclerotinia libertiana Fckl.

One report from Prince Edward Island, where a 75% infection was noted in two fields.

MILDEW, caused by Bremia Lactucae Regel.

Caused trouble in a number of greenhouses in Ontario.

BACTERIAL SOFT ROT, caused by Pseudomonas sp.

One report of a 20% loss in Essex Co. in a plot containing about six hundred heads.

MANGEL

CROWN GALL, caused by Bacillus tumefaciens E.F.S.
A specimen of this disease was sent to the Central Laboratory from Apopaqui, N.B.

SOFT ROT, caused by Bacillus carotovorus Jones
This disease caused considerable damage in the Summerland District, B.C.

DISEASES OF DOUBTFUL ORIGIN

"Wherever the soil is lacking in humus and consequently low in water and nitrogen content, a disease resembling that caused by Phoma Betae (Ond.) Frank, was found attacking mangels to a considerable extent both in Vancouver Island and the Okanagan. It is decidedly less common in the Fraser River delta." (P.A.Boving,B.C.)
"A disease of seedling mangels, apparently identical with that described by Sorauer (Eng.Ed. pages 226 et seq.) under the name of 'root blight' was observed on Lulu Island. It is noteworthy that it was most marked when, owing to weather or labour conditions,the soil had been allowed to bake or form a hard crust around the young plants". (J.W. Eastham, B.C.)

MELON

Three diseases are reported, viz.; wilt, caused by Bacillus tracheiphilus E.F.S. affected about 1.5% of the plants at the Experimental Station, Morden, Man.; leaf spot, caused by Alternaria Brassicae (Berk.) Sacc.,

caused considerable damage to two or three patches in the Niagara Peninsula; and the downy mildew, caused by Pseudoperonospora cubensis (B. et C.) Rostoro, which did some damage to frame grown plants in Morden, Man.

ONION

SMUT, caused by Urocystis Cepulae Frost.

Ont.-
It has been found in Mersea and Leamington townships, Essex County.

Que.-
In several districts around Montreal this disease was so serious that some of the fields had to be ploughed under.

Man.-
It has been found in some truck gardens in the vicinity of Winnipeg.

DOWNY MILDEW, caused by Peronospora Schleideni Ung.

Reported from Agassiz, B.C., and a 10% infection in P.E.I.

PEA

SPOTS, caused by Mycosphaerella pinnodes Berk. et Blox. and Septoria Pisi West.

Sask.-
Quite common in northern Saskatchewan, a severe infection being found at Scott.

Man.-
Present to a moderate extent in truck gardens.

N.S.-
Infections were general in some gardens in Pictou and Colchester Counties.

MILDEW, caused by Erysiphe Polygoni DC.

Man.- Slight damage at Morden.

Que.- General, but not serious in Sherbrooke County.

P.E.I.- A mild infection.

RUST, caused by Uromyces Pisi (Pers.) Wint.

A moderate infection, late in the season, was reported from Manitoba.

ANTHRACNOSE, caused by Colletotrichum Pisi Pat.

In south-western Manitoba it was epidemic, causing a premature drying of the plants with considerable reduction in yield. This disease has been reported from Wisconsin only. (I.L. Conners)

MOSAIC, cause unknown

Slight infection in Essex Co., Ont. At Macdonald College, Que., it was pronounced in field plots of Golden Vine, Canadian Beauty, Prussian Blue and Chancellor.

ROOT ROT AND BLIGHT, caused by Fusarium and Pythium spp.

This disease is reported from Prince Edward and Hastings Counties, Ont., again this year. The amount of infection this year is not quite as extensive as it was last year, as more care was taken in selecting fields which had either not grown peas recently or had not shown any previous symptoms of the trouble. (R.E. Stone)

In Hastings Co., in a garden plot, 80% of the Little Marble variety were diseased. The Horsfood Improved and Telephone varieties growing alongside were apparently resistant. (G.C. Chamberlain)

In Essex Co. a Fusarium wilt infection was observed causing a 50% loss in one plot and a total loss in two others.

PEPPER

BLOSSOM END ROT, cause unknown

In Manitoba, this disease is common and with some varieties very serious.

POTATO

SEED CERTIFICATION

The following summaries of field inspections of potatoes have been supplied by G. Partridge, Chief Inspector, and C. Tice, Vegetable Specialist for British Columbia. They indicate the acreages inspected and passed for certification; the average percentage of disease in inspected, passed and rejected fields; also the number of fields rejected for each disease or other cause of rejection.

These summaries are followed by provincial summaries in which the same information is given for the individual provinces. This information gives some indication of the prevailing diseases in each province, and together

with the reports from the collaborators on each disease, form a fairly complete survey of the potato diseases which are found in Canada.

FIELD INSPECTION OF POTATOES, 1923.

SUMMARY OF ALL PROVINCES EXCEPT BRITISH COLUMBIA

No. applications received	No. fields inspected	No. acres inspected	No. fields passed	No. acres passed	Per cent of fields passed	Per cent of acres passed
1297	2914	9681	2061	7099¼	70.7	73.3

	Black leg	Leaf roll	Mosaic	Wilts
Average per cent disease in total fields inspected	.62	.81	2.25	.14
Average per cent disease in fields passed	.36	.42	.62	.064
Average per cent disease in fields rejected	1.2	1.3	4.3	.27

Reasons for rejection of fields:

Black leg	72	fields
Leaf roll	75	"
Mosaic	440	"
Wilts	14	"
Foreign varieties	138	"
Proximity to diseased fields	26	"
Lack of vigour	43	"
Lack of cultivation	1	"
Insect injury	13	"
Frost injury	8	"
Hail injury	1	"
Mosaic and Wilts	1	"
Rhizoctonia	7	"
Failure of crop	2	"
Withdrawn by grower	2	"
Not accepted for various reasons (chiefly climatic conditions	9	"

Total fields rejected - 853

Total acreage rejected - 2581¾

SUMMARY FOR BRITISH COLUMBIA

Variety	Fields	Ac.	Leaf Roll	Mosaic	Black Leg	Wilt	Impurities
Irish Cobbler	15	7.00	.08	1.83	-	-	.23
Early Rose	17	7.45	.13	1.05	.12	.05	.11
Sutton's Reliance	1	.25	-	-	1.25	-	-
Early Surprise	1	.10	-	1.25	-	-	.25
Jones' White	1	.25	-	-	-	-	-
Wee McGregor	4	3.45	.07	.12	.42	-	-
Jersey Royal	11	9.60	.10	1.55	.12	-	.11
Burbank	19	9.40	.04	3.50	.01	-	.02
Early St.George	16	9.10	.10	1.16	.32	-	.11
Netted Gem	77	74.75	.15	.75	.18	.03	.17
Up-to-date	4	3.75	.20	.50	-	-	-
Green Mountain	41	26.40	.13	1.52	.25	.01	.03
Eureka	1	.25	-	-	-	-	1.75
Beauty of Hebron	1	.25	-	-	-	-	.50
Early Ohio	7	2.65	-	3.07	.40	.20	-
Gold Coin	11	6.60	.41	.53	.27	.06	.05
Sir W. Raleigh	18	15.15	.10	.86	-	.07	-
Houlton Rose	1	.05	2.77	-	-	-	-
Early Bovee	1	.05	-	-	-	-	-
Early Six Weeks	1	.50	.25	2.75	-	-	-
	248	177.00					

Average percentage of diseases for all districts
(Uncertified)

District	Fields	Ac.	Leaf Roll	Mosaic	Black Leg	Wilt	Impurities
Sea Island	1	4	.50	1.25	.25	1.50	.75
Mt.Lehman	1	1	-	4.00	1.00	-	75.00
Chilliwack	7	-	.13	-	2.00	17.75	.75
Ladner	6	20	-	5.25	.37	.46	3.71
Pitt Meadows	4	6	-	1.62	.37	.44	1.06
Essondale	1	5	24.00	2.00	.25	.75	12.50
Surrey	3	5	-	4.30	-	-	2.00
Malakwa	2	2	-	-	-	-	-
Kelowna	1	1.5	2.00	5.00	-	.50	-
Vernon	1	1		30.00	3.00	1.00	-
Shawnigan	2	3.00	-	94.00	-	-	3.00
Errington	1	2.00	10.5	80.00	-	-	8.00
Alberni	6	12.00	.47	1.40	1.03	-	1.83
Courtenay	5	1.50	-	2.50	-	-	-
Gordon Head	5	3.50	.72	48.58	.33	-	.20
Sooke	1	1.00	.50	-	-	9.00	5.50
Metchosin	2	1.00	-	50.50	-	-	-
Keatings	4	3.00	.25	10.10	-	-	-
Agassiz	4	6.50	-	15.00	-	-	-
	57	79	2.05	18.71	.45	1.65	6.03

FIELD INSPECTION OF POTATOES, 1923

ALBERTA

No. fields inspected	No. acres inspected	No. fields passed	No. acres passed	Per cent of fields passed	Per cent acres passed
151	354	107	174¾	70.9	49.4

	Black leg	Leaf roll	Mosaic	Wilts
Average per cent disease in total fields inspected	1.5	.2	1.2	.004
Average per cent disease in fields passed	.5	.1	.8	.005
Average per cent disease in fields rejected	3.9	.3	2.3	0.0

Reasons for rejection of fields:

Black leg	21	fields
Leaf roll	1	"
Mosaic	10	"
Presence of foreign varieties	5	"
Wilts	1	"
Rhizoctonia	4	"
Lack of vigour	2	"
Total	44	"

Total fields rejected, 44: Total acreage rejected, 179½.

FIELD INSPECTION OF POTATOES, 1923

SASKATCHEWAN

No. fields inspected	No. acres inspected	No. fields passed	No. acres passed	Per cent of fields passed	Per cent of acres passed
108	446¼	78	242¾	72.2	54.6

	Black leg	Leaf roll	Mosaic	Wilts
Average per cent disease in total fields inspected	.7	.2	.9	0.0
Average per cent disease in fields passed	.5	.1	.01	0.0
Average per cent disease in fields rejected	1.3	.4	3.3	0.0

Reasons for rejection of fields:

Black leg	8	fields
Leaf roll	1	"
Mosaic	11	"
Presence of foreign varieties	7	"
Lack of vigour	3	"
Total	30	"

Total fields rejected, 30: Total acreage rejected, 203½.

FIELD INSPECTION OF POTATOES, 1923.

MANITOBA

No. fields inspected	No. acres inspected	No. fields passed	No. acres passed	Per cent of fields passed	Per cent of acres passed
102	391	74	267	72.5	68.2

	Black leg	Leaf roll	Mosaic	Wilts
Average per cent disease in total fields inspected	.37	1.5	1.1	1.0
Average per cent disease in fields passed	.2	.98	.8	.4
Average per cent disease in fields rejected	1.08	1.9	1.6	2.2

Reasons for rejection of fields:

Black leg	3	fields
Leaf roll	16	"
Mosaic	4	"
Wilts	4	"
Presence of foreign varieties	1	"
Total	28	"

Total fields rejected, 28: Total acreage rejected, 124.

FIELD INSPECTION OF POTATOES, 1923.

NORTHERN ONTARIO

No. fields inspected	No. acres inspected	No. fields passed	No. acres passed	Per cent of fields passed	Per cent of acres passed
162	200½	100	149¾	61.7	74.7

	Black leg	Leaf roll	Mosaic	Wilts
Average per cent disease in total fields inspected	.9	1.0	2.6	.09
Average per cent disease in fields passed	.4	.9	1.5	.07
Average per cent disease in fields rejected	1.4	1.6	3.0	.1

Reasons for rejection of fields:

Black leg	7	fields
Wilt	1	"
Leaf roll	4	"
Presence of foreign varieties	13	"
Mosaic	2	"
Lack of vigour	17	"
Frost injury	4	"
Hail injury	1	"
Rhizoctonia	2	"
Failure of crop	2	"
Not recommended for various reasons (chiefly climatic conditions)	9	"
Total	62	"

Total fields rejected, 62:
Total acreage rejected, 50¾

FIELD INSPECTION OF POTATOES, 1923.

SOUTHERN ONTARIO

No. fields inspected	No. acres inspected	No. fields passed	No. acres passed	Per cent of fields passed	Per cent of acres passed
142	308¼	71	195¾	50.0	63.5

	Black leg	Leaf roll	Mosaic	Wilts
Average per cent disease in total fields inspected	.31	3.9	2.6	.07
Average per cent disease in fields passed	.2	1.3	.9	.03
Average per cent disease in fields rejected	.4	4.9	3.9	.006

Reasons for rejection of fields:

Leaf roll	40 fields
Mosaic	9 "
Lack of vigour	4 "
Presence of foreign varieties	14 "
Rhizoctonia	1 "
Withdrawn by growers	2 "
Total	71 "

Total fields rejected, 71; Total acreage rejected, 112½.

FIELD INSPECTION OF POTATOES, 1923

QUEBEC

No. fields inspected	No. acres inspected	No. fields passed	No. acres passed	Per cent of fields passed	Per cent of acres passed
417	959½	268	573¼	64.3	59.7

	Black leg	Leaf roll	Mosaic	Wilts
Average per cent disease in total fields inspected	.44	.38	5.8	.006
Average per cent disease in fields passed	.3	.35	.85	.008
Average per cent disease in fields rejected	.7	.45	15.1	.004

Reasons for rejection of fields:

Black leg	5	fields
Leaf roll	3	"
Mosaic	113	"
Presence of foreign varieties	24	"
Frost injury	4	"
Total	149	"

Total fields rejected, 149: Total acreage rejected, 386¼

FIELD INSPECTION OF POTATOES, 1923.

NEW BRUNSWICK

No. fields inspected	No. acres inspected	No. fields passed	No. acres passed	Per cent of fields passed	Per cent of acres passed
837	3475¼	485	2223¼	57.9	64.0

	Black leg	Leaf roll	Mosaic	Wilts
Average per cent disease in total fields inspected	.54	.15	4.5	.06
Average per cent disease in fields passed	.28	.09	.65	.03
Average per cent disease in fields rejected	.9	.23	9.9	.09

Reasons for rejection of fields:

Black leg	13	fields
Leaf roll	4	"
Mosaic	234	"
Wilts	7	"
Presence of foreign varieties	52	"
Lack of vigour	10	"
Insect injury	9	"
Too close proximity to diseased fields	23	"
Total	352	"

Total fields rejected: 352; Total acreage rejected: 1252.

FIELD INSPECTION OF POTATOES, 1923.

NOVA SCOTIA

Varieties other than Garnet Chili

No. fields inspected	No. acres inspected	No. fields passed	No. acres passed	Per cent fields passed	Per cent acres passed
90	178¾	54	86½	60.0	48.4

	Black leg	Leaf roll	Mosaic	Wilts
Average per cent disease in total fields inspected	.17	.25	2.9	.18
Average per cent disease in fields passed	.07	.16	.28	.07
Average per cent disease in fields rejected	.3	.4	6.5	.02

Reasons for rejection of fields:

Black leg	2 fields
Leaf roll	2 "
Mosaic	28 "
Mosaic and Wilts	1 "
Lack of vigour	1 "
Presence of foreign varieties	2 "
Total	36 "

FIELD INSPECTION OF POTATOES, 1923.

NOVA SCOTIA

Garnet Chili

No. fields inspected	No. acres inspected	No. fields passed	No. acres passed	Per cent fields passed	Per cent acres passed
80	154¾	70	137½	87.5	88.8

	Black leg	Leaf roll	Mosaic	Wilts
Average per cent disease in total fields inspected	.6	.5	.1	0
Average per cent disease in fields passed	.5	.2	0	0
Average per cent disease in fields rejected	.6	2.8	.1	0

Reasons for rejection of fields:

Black leg	1 field
Leaf roll	4 "
Presence of foreign varieties	2 "
Proximity to diseased fields	3 "
Total	10 "

FIELD INSPECTION OF POTATOES, 1923

PRINCE EDWARD ISLAND

No. fields inspected	No. acres inspected	No. fields passed	No. acres passed	Per cent of fields passed	Per cent of acres passed
825	3212¾	754	3048¾	91.4	94.9

	Black leg	Leaf roll	Mosaic	Wilts
Average per cent disease in total fields inspected	.7	.02	.82	.05
Average per cent disease in fields passed	.7	.02	.4	.03
Average per cent disease in fields rejected	1.6	.004	5.2	.25

Reasons for rejection of fields:

Black leg	12	fields
Mosaic	29	"
Wilts	1	"
Presence of foreign varieties	18	"
Lack of vigour	6	"
Lack of cultivation	1	"
Insect injury	4	"
Total	71	"

Total fields rejected; 71: total acreage rejected; 164.

LATE BLIGHT, caused by
Phytophthora infestans de Bary

B.C.-

This disease is not troublesome at Point Grey, and experiments show no results in favour of spraying, although it is required in low lying districts of the Fraser Valley. At Agassiz it was scarce this year, although bad in 1921 and 1922.

Alta.-

Not observed.

Sask.-

Not observed.

Ont.-

Rather less than usual in most parts of the province, but bad at the Central Experimental Farm, Ottawa, causing a loss of about 20% of the harvested crop of Green Mountains and 1% on Irish Cobblers.

Que.-

Serious throughout the Sherbrooke District. At Macdonald College, it did not appear until September 23rd, and was too late to influence the yield.

N.S.-

In the counties of Hants and Colchester, serious infections occurred, causing losses ranging from 6% to 30% of the crop. In Annapolis County it was much less prevalent than usual, appearing for the most part late in the season, and causing little damage. There is much less rot in storage than usual.

EARLY BLIGHT, caused by
Alternaria Solani (E. et M.) J. et G.

B.C.-
Not of any importance at Agassiz.

Alta. and Sask.-
It was severe and general throughout northern Saskatchewan and northern Alberta, causing considerable reduction in yield. It was the most severe attack ever noticed in these provinces.

Man.-
Common, but the injury was not serious. It nevertheless paid to spray with Bordeaux mixture.

Ont.-
One report from Essex County, in which a 100% infection was noted in one field, slight to moderate in four others.

Que.-
Observed in all fields at Macdonald College to a moderate extent. Traces in Matane and Bonaventure Counties.

N.S.-
Did not appear until late in the season, and then causing little damage.

WILT, caused by Fusarium oxysporum Schl.

Reported only from Manitoba, where this disease affected an average of 1.5% of the plants at Morden. The field inspections, however, also show the presence of this disease in British Columbia, Alberta, Ontario, Quebec, New Brunswick, Nova Scotia and Prince Edward Island.

RHIZOCTONIA, caused by
Corticium vagum Solani B. et C.

B.C.-
Widespread, but of varying severity.

Alta. and Sask.-
Very common as usual.

Man.-
Somewhat less abundant than usual. At Morden, 45% of the plants were affected, although not as severe as usual. A percentage of 5.6 of the tubers were affected.

Que.-
A trace reported from Matane and Rimouski Counties.

SCAB, caused by Actinomyces scabies (Thax.) Güssow

B.C.-
Very prevalent throughout the province, particularly on land rented by the Chinese and planted to potatoes year after year.

Alta.-
Present to a limited extent at Beaverlodge.

Man.-
Common: a heavy infection developed on treated seed on virgin soil just cleared at Winnipeg. Seed treatment gives fair results unless the soil is too heavily infected. Sulphur applications to the soil lessened the attack but was scarcely practicable.

(Bisby and Bailey)

Que.-
In Sherbrooke County it was quite prevalent.

N.S.-
At Nappan there was a slight infection.

BLACK LEG, caused by Bacillus solanisaprus Har.

B.C.- One field in Summerland found to be badly affected.

Man.- Not much found except in one instance, where there was 20%.

Que.- Severe attacks found in Rimouski, Matane, Bonaventure and Champlain Counties; infections varying from 4 to 25%.

N.S.- In Colchester and King's Counties an average of 5% of this disease was found. At Nappan Irish Cobblers showed 1.5% and Davis Warrior 2.5%.

DISEASES OF UNKNOWN ORIGIN

TIP BURN

Man.- Common and causing some reduction in yield.

Que.- Present at Macdonald College, but in most cases obscured by the greater injury caused by aphids.

LEAF ROLL

Man.- It continues to be one of the commonest and most insidious potato diseases.

Que.- In Rimouski, Matane and Bonaventure Counties the disease is common, with infections ranging from 1 to 6%.

N.S.- At Nappan the following percentage infections were

noted among the varieties grown:

Edzell Blue	100%	Barnhouse Beauty	100%
Majestic	60%	King George	80%
Kerr's Pink	25%	King Edward	8%
British Queen	8%	Irish Cobbler	2%
Green Mountain	0		

MOSAIC

B.C.-
Prevalent in all districts.

Man.-
Fairly common. The symptoms are likely to be masked.

Ont.-
One report from Essex County, where there was an average of 10% of the hills affected.

Que.-
Serious in Sherbrooke, Rimouski, Matane, Bonaventure and Champlain Counties.

N.S.-
At Nappan infections by varieties were as follows:

Mills Pride	100%	Carman No.1	8%
Green Mountain		Empire State	40%
Garnet Chili		Valley Success	20%
White Rose		Early Six Weeks	30%
Great Scott	36%	Irish Cobbler	20%
		Prairie Flower	35%

The following were free from the disease:

King Edward	Majestic
Edzell Blue	Beauty of Hebron
Barnhouse Beauty	Factor
King George	

NET NECROSIS

Not as common this year as last in Manitoba.

CURLY DWARF

At Morden, Man., occasional plants were affected. In Bonaventure Co., Que., about 2% was present in one field

which had 20% mosaic and resembled plants with severe mosaic.

SPINDLE TUBER

Spindle tuber as described by Shultz and Folsom (J.A.R. 25, 2) has been found in one or two strains of Irish Cobblers. An effort is being made to rid New Brunswick of these strains by selling the crops as table stock. This disease is of major importance to seed buyers from the United States, hence the necessity of cleaning out strains of seed which now show any appreciable extent of spindle tuber. Our Green Mountain strains appear to be practically free from the disease. (Hockey and Richardson)

STREAK

In New Brunswick this was found on a few plants of the Spaulding Rose and Beauty of Hebron varieties.

RHUBARB

LEAF SPOT, caused by Ascochyta Rhei E. et E.

This was present to a considerable extent at Macdonald College, Que.

LEAF SPOT, caused by
Phyllosticta straminella Bres.

Caused some damage in south-western Manitoba.

ANTHRACNOSE, caused by
Colletotrichum erumpens Sacc.

Considerable petiole infection at Macdonald College, Que.

CROWN ROT, cause unknown

B.C.-

A severe crown rot occurred at the Experimental Station, Summerland. The cause was not determined.

Man.-

In the disease found at Brandon, the whole plant is badly stunted; the leaves are not more than one-quarter of the normal size and are usually red or faded. The stems rot at their bases. It was doing considerable damage.

SPINACH

MILDEW, caused by
Peronospora effusa (Grev.) Rab.

Found at the Experimental Farm, Charlottetown, P.E.I., in one patch to the extent of 80%.

ANTHRACNOSE, caused by
Colletotrichum Spinaciae E. et H.

At Macdonald College, Que., the second crop of spinach was so heavily infected with this disease that it was unfit for use and ploughed under.

TOBACCO

ROOT ROT, caused by
Thielavia basicola (B. et Br.) Zopf.

In Ontario the effects of this disease were most noticeable towards the end of the season, although traces were found in the early part of August in about 10% of the fields of Burley visited. During the first week of September it was to be noticed

fairly generally in the Burley district, with an occasional field of flue-cured varieties showing signs of infection. The total loss, however, was slight. In Quebec the disease was somewhat more prevalent in both the Yamaska and North Shore districts. The greatest losses occurred on the heavier, rather poorly drained soils, and where tobacco is cropped continuously.

WILT, caused by Fusarium oxysporum (Schl.) Wolm. var. Nicotianae John.

Three cases of this disease were reported, one from Quebec and two from Ontario.

DAMPING OFF, caused by Rhizoctonia and Fusarium spp.

In Ontario this disease was present to a limited extent, mostly on glass covered beds. In Quebec approximately 45% of the beds inspected in the Yamaska Valley and 75% in Joliette and Montcalm Counties, were affected. The losses ranged up to 40% in the affected beds.

WILD FIRE, caused by Bacterium tabacum W. et F.

This disease has not yet been found in Canada.

ANGULAR LEAF SPOT, caused by Bacterium angulatum Fromme et Murray

This was noted in Canada for the first time during the latter part of the summer of 1922, the crop on two farms in Norfolk County, Ont., being almost destroyed. It was not found in 1923.

DISEASES OF UNKNOWN ORIGIN

MOSAIC

Ont.-

This disease was most prevalent in the flue-cured belt in southern Essex County and to a lesser extent in the Burley districts of Kent and Elgin Counties, Warne, Hickory Prior and White Burley being the most severely affected varieties.

Que.-

A small percentage was present in the majority of the fields inspected, and a few cases of the disease occurred in seed beds in Joliette and Montcalm Counties.

FRENCHING

Occasional plants were observed throughout the Ontario districts.

RING SPOT

A disease similar to the one described by Fromme and Wingard (Virginia Tech. Bull. 25) under this name was found in Essex County in two fields of Broad leaf Burley to the extent of 60% and 1% respectively.

EARLY BLOSSOMING

An entire ten-acre field of Warne in Essex County had to be ploughed up because of the plants having headed out when only about twelve inches in height.

PHYSIOLOGICAL DISEASES

DROUGHT SPOT, HAIL AND WIND INJURY

This caused some loss in Essex County, Ont., shortly after transplanting.

FERTILIZER BURN

This was found in a number of the seed beds in Essex County, Ont. In one instance an over application of fresh manure resulted in a condition resembling root rot. (T.G. Major)

TOMATO

LEAF SPOT, caused by Septoria Lycopersici Speg.

Man.-
It made its appearance about August 1st at one end of a tomato patch at Brandon, and by the end of the season it had spread fifty feet across the entire patch. It was severe only where first observed, especially in the pruned plants.

Ont.-
Serious at Sturgeon Falls. Fairly common in the Niagara District, but of no economic importance.

Que.-
One report from Sherbrooke County, where there was a serious infection.

P.E.I.-
Severe infection on plants which were staked.

EARLY BLIGHT, caused by
Alternaria Solani (E. et M.) J. et G.

Man.-
It is of occasional occurrence.

Que.-
Quite serious in Sherbrooke County. At Macdonald College there was a heavy infection on leaves and fruit in August and September. Considerable damage was done to the fruit.

P.E.I.-
An infection of 60% was observed at the Experimental Farm, Charlottetown.

DISEASES OF UNKNOWN ORIGIN

BLOSSOM END ROT

B.C.-
Of frequent occurrence. At Summerland, in fields in which estimates were made, the losses ran as high as 6%.

Man.-
At Brandon it was evident in considerable abundance. At Morden it did much damage to thin skinned varieties such as Bonny Best. In southeastern Manitoba it continues to be common and rather serious.

Ont.-
In one greenhouse in Essex County, 25% of the fruit was affected. In Frontenac County 30% was affected, and in Halton County a slight infection was reported. In the Niagara District it is common but not serious this year.

Que.-

One report from Sherbrooke County, where a slight loss was incurred.

MOSAIC

Three reports from Essex County, this disease being common both in the fields and greenhouses. In Missisquoi and Rouville Counties, Que., up to 20% of the plants were affected in ten cold frames inspected.

STREAK

Continues to give trouble in greenhouses both in Ontario and Quebec, especially in those houses which use heavy applications of nitrogenous fertilizers and neglect potash and phosphoric acid.

TURNIP

CLUB ROOT, caused by Plasmodiophora Brassicae Wor.

Man.-

Not found at Morden.

Ont.-

Reported from Thunder Bay District, but not serious.

Que.-

Found to varying extents in Sherbrooke, Matane, Rimouski and Temiscouata Counties.

N.B.-

Very little reported.

N.S.-

In Annapolis County it has been getting somewhat worse each year, gradually spreading from one

field to another, and is more readily found than it used to be. In Hants and Colchester Counties severe infections are recorded. At Nappan Experimental Farm the following infections on varieties are reported:

Danish Sludstrop	30.5%	Sutton's Champion	31%
Bankholm	45	Monarch	16
Best of all	11	Bankholm Purple Top	16
Ditmars	10	Yellow Tankard	13
Bangholm Club Resistant			%

P.E.I.-
Infections ranging from 3 to 25%.

ROT, caused by Bacillus carotovorus Jones

B.C.-
This disease has been observed in three different places at the time of harvesting. It attacked 80 to 95% of the roots at a farm in Pitt Meadows, but in the other two cases at Milner and Langley Prairie, the damage was almost negligible, amounting to less than .5%.

Man.-
Reported from Morden to the extent of 1%.

FOREST AND SHADE TREE DISEASES

ASH (*Fraxinus* spp.)

LEAF SPOTS, caused by (*Piggotia Fraxini* B. et C.
(*Septoria Besseyi*
(*Phyllosticta viridis* E. et K.

Reported from Manitoba.

BALSAM FIR (*Abies balsamea* (L.) Miller)

RED HEART ROT, caused by
Stereum sanguinolentum Alb. et Schw.

Very common and destructive in the western portion of the Province of Quebec.

FEATHER ROT, probably caused by
Poria subacida Pers.

Of frequent occurrence as a butt rot in western Quebec.

RUST, caused by
Melampsorella elatina (Alb. et Schw.) Arth.

Many witches' brooms found in various parts of New Brunswick. In York County infection was very common on reproduction.

BIRCH (white and yellow)
(*Betula alba* var. *papyrifera* (Marsh)
Spach. and *B. lutea* Michx.)

HEART ROT, caused by (*Fomes fomentarius* Fr.
(*Fomes igniarius* Fr.

On a representative area in eastern Quebec, twenty-five average trees were selected and felled in order to secure data upon the wood rots affecting them. In reality the birch in this area is over-

mature, and from a silvicultural point of view should have been taken out fifty years ago. Every tree examined was badly decayed - 71% by Fomes fomentarius, 8% by Fomes igniarius, and 21% in which both forms were present.

BUTTERNUT (Juglans cinerea L.)

LEAF SPOT, caused by Gnomonia leptostyla (Fr.) Ces. et de Not.

Again common at Macdonald College, Que., causing premature defoliation.

CHESTNUT (Castanea dentata (Marsh) Borkh.)

BLIGHT, caused by Endothia parasitica (Murr.) And.

This disease has practically destroyed the chestnuts in the United States, and has now made its appearance in Ontario. At the present time there are many trees diseased in Welland County, and the disease is also known to occur in Norfolk County. It is possible that it will cause very serious losses in any section where the chestnut appears in any quantity.

(R.E. Stone)

ELM (Ulmus americana L.)

LEAF SPOT, caused by Gnomonia Ulmea (Sacc.) Thüm.

Present in Sherbrooke and adjacent counties, Quebec, to a considerable extent. Also reported from Manitoba,

HORSE CHESTNUT (*Aesculus Hippocastanum* L.)

LEAF SPOT, caused by
Phyllosticta sphaeropsidea E. et E.

Observed in Perth County, Ont., and in Annapolis, Digby and Colchester Counties in Nova Scotia.

MAPLES

Acer Negundo L.

LEAF SPOTS, caused by (*Phyllosticta Negundinis*
(*Septoria Negundinis*
(*Septoria* sp.

Reported from Manitoba.

TWIG BLIGHT, caused by
Coryneum Negundinis B. et C.

In the vicinity of Guelph, Ont., the Manitoba Maples show a blighting of the young twigs caused by the above named fungus. This is apparently the first report of this blighting in Ontario. (R.E. Stone)

Acer saccharum Marsh

LEAF SPOT, caused by
Phyllosticta minima (B. et C.) E. et E.

Prevalent in Stanstead Co., Que.

WILT, caused by *Verticillium* sp.

Severe cases of this disease were observed at Ottawa and one at Fenwick, Ont. This disease works rapidly; in one instance a tree about twenty-five feet in height was killed within three months of the time that the symptoms first appeared.

OAK (Quercus macrocarpa Michx.)

LEAF SPOT, caused by Phyllosticta livida

Reported from Manitoba.

POWDERY MILDEW, caused by
Microsphaera Alni (Wallr.) Salm.

Reported from Manitoba.

PINES

BLISTER RUST, caused by
Cronartium ribicola F. de Wald.

Pinus monticola Dougl. (Western White Pine)

B.C.- Infection on both hosts is now general throughout the coastal area of distribution of white pine. Evidence tending to support the theory of long distance aecial spread was obtained when the currant stage of the rust was found at Bella Bella, 110 miles north of the known limit of distribution of white pine and about 100 miles west of the range of white barked pine. Further, Ribes infection was common in the Dry Belt, which, it was hoped, would prove to be a barrier to the eastward spread of rust. Such infection may quite possibly have resulted from aeciospores wind borne from the coast. In the interior rust was found to a much greater extent than last year. In all, 72 infected pines in four localities were located and destroyed. Last year only 14 diseased trees were found. Infection

on black currants was very heavy and widespread, while more infection of wild Ribes was observed this year. In general, rust is apparently firmly established in the valleys of the Arrow and Okanagan lakes, and at one point on Kootenay lake.

Pinus albicaulis Engelm. (White-barked Pine)

B.C.-

Last year a single infected tree in the swelling stage was found at Point Grey. This year aecia were produced. This is the first case of blister rust on this species reported for North America,

Pinus strobus L. (White Pine)

B.C.-

Rust on white pine was observed in Stanley Park, Vancouver, in 1921 and again this year at Agassiz.

Ont.-

Inspection in the Rainy River district failed to reveal the presence of rust on either host. Rust on Ribes was found in several new localities in Renfrew County and across the Ottawa river in Quebec. As has been the case previously in connection with the occurrence of rust in this most northerly known area of distribution, only the currant stage was found, although many pines in close proximity to infected Ribes were carefully examined. Diseased pines were noted in southern Ontario as usual.

N.B.-

Blister rust on both hosts found at two points.

N.S.-
Infection is fairly general in this province, mostly on black currants, but in some instances pines were found diseased.

P.E.I.-
Rust reported from four localities. Confined to black currants.

RUST, caused by
Peridermium Harknessii Moore

Pinus ponderosa Dougl. (Western Yellow Pine)

B.C.-
One heavily infected tree in the arboretum of the Experimental Farm at Agassiz. (Determined by Dr. E. Bethel)

RUST, caused by
Cronartium cerebrum (Peck.) Hedg. et Long.

Pinus banksiana Lam. (Jack Pine)

Very common in the Thunder Bay District, Ont.

POPLARS

Populus balsamifera L.

LEAF SPOT, caused by Septoria musciva

Reported from Manitoba.

Populus tremuloides Michx.

RUST, caused by Melampsora Medusae Thüm.
MILDEW, caused by Uncinula Salicis (DC.) Winter.
LEAF SPOT, caused by Cladosporium subsessile

All reported from Manitoba.

Populus sp. (Russian Poplar)

RUST, caused by Melampsora Medusae Thüm.

Reported from Manitoba and Saskatchewan.

SERVICE BERRY (*Amelanchier alnifolia* Nutt.)

RUST, caused by
Gymnosporangium corniculans Kern.

Reported from Manitoba.

SPRUCE (black)(*Picea mariana* (Mill.) B.S.P.

RUST, caused by
Melampsoropsis ledicola (Peck.) Arth.

Common at Norway House, Man.

WILLOW (*Salix* spp.)

RUST, caused by *Melampsora Bigelowii* Thüm.

Common in Manitoba.

TAR SPOT, caused by *Rhytisma salicinum* Fr.

Reported from Manitoba.

MILDEW, caused by *Uncinula Salicis* (DC.) Winter.

Reported from Manitoba.

CANKER, caused by *Valsa* sp.

Very common in Manitoba.

DISEASES OF ORNAMENTAL PLANTS

AMPELOPSIS SP.

MILDEW, caused by *Uncinula necator* (Schw.) E. et E.

Reported from Bethany, Manitoba.

ASTER

WILT, caused by *Fusarium conglutinans Callestephi* Beach

B.C.-
Common on young plants at the Experimental Station, Summerland, and present every year at Agassiz.

Alta.-
In the Vauxhall district and at Raymond it was found doing considerable damage.

Man.-
In the south-east it was serious in many places. In the south-west an average of 5% of the plants were attacked, at all stages of development from transplants to maturity. At Morden the damage amounted to 6%.

Ont.-
In the Ottawa district this disease was again prevalent this year, causing losses up to 10% of garden plantings. A specimen was sent from Wako. In the Niagara district there was very little.

Que.-
In Sherbrooke and vicinity it was serious and general.

N.B.-
At the Experimental Station, Fredericton, 20% of a variety bed was killed. All varieties seemed to be

equally susceptible.

P.E.I.-
Not observed.

RUST, caused by
Coleosporium Solidaginis (Schw.) Thüm.

Found to a small extent in south-western Manitoba.

LEAF SPOT, caused by
Septoria Callestephi Gloyer

Common in both south-eastern and south-western Manitoba, causing upwards of 40% destruction of leaf surface.

YELLOWS, cause unknown

Reported from south-western Manitoba, causing a loss of 75% of the plants in one garden. Very prevalent also in the Ottawa district.

AZALEA

LEAF GALL, caused by
Exobasidium Vaccinii (Fcl.) Wor.

A florist in London, Ont., submitted a specimen of this disease, and a number of cases have been reported by inspectors at the ports of entry.

BARBERRY

RUST, caused by Puccinia graminis Pers.

B.C.-
Present at the Experimental Farm, Agassiz.

Man.-
The first report of the season was from St.Vital on June 5, when there were a few aecia open.

Ont.-Bushes in Lanark and Carleton Counties reported as

heavily infested.

N.S.-
At Truro 1% of the leaves on bushes were infected on June 20.

BUCKTHORN (*Rhamnus* spp.)

CROWN RUST, caused by
Puccinia coronata Cda.

Sask.-
Considerable infection at Indian Head.

Man.-
Found at Morden, Gladstone, Winnipeg and at the Agricultural College farm.

Ont.-
Heavy infections in Lanark and Carleton Counties.

CYCLAMEN

ROOT BROWN, caused by *Thielavia basicola* Zopf.

In the botanical greenhouse at the Central Experimental Farm, Ottawa, a large proportion of the cyclamens showed dark brown to black lesions on the roots; the plants failed to grow normally; few flower buds opened, and those which did showed considerable distortion. Clamydospores of *Thielavia* were found in abundance on the root lesions. (T.G. Major)

FLOWERING CURRANT (*Ribes aureum* Pursh.)

LEAF SPOT, caused by *Septoria Ribis* Desm.

Found in Winnipeg, Manitoba.

HAWTHORN (*Crataegus coccinea* L.)

LEAF SPOT, caused by *Septoria* sp.

Reported from Winnipeg, Man.

HOLLYHOCK

RUST, caused by *Puccinia Malvacearum* Mont.

B.C.- At the Experimental Station, Summerland, the plants were completely defoliated.

Ont.- Prevalent in Carleton and Prescott Counties. Also abundant in the Niagara Peninsula.

Que.- Present, but not serious, in Sherbrooke County.

N.B.- Destructive wherever this plant is grown. There is a consistent demand for effective control measures.

N.S.- Unusually prevalent.

P.E.I.- Infections as high as 100% were noted.

LEAF SPOT, caused by *Cercospora Althaeina* Sacc.

Quite abundant in south-eastern Manitoba.

HONEYSUCKLE

MILDEW, caused by *Microsphaera Alni* (Wall.) Salm.

Reported from Minnedosa, Man.

IRIS

RHIZOME ROT, caused by *Bacillus carotovorus* Jones

Ont.-

Not as prevalent this year. Many cases were found associated with the Iris Rhizome Borer (*Macronoctua onusta*).

P.E.I.-

Small percentage affected.

LILAC

MILDEW, caused by *Microsphaera Alni* (Wall.) Sacc.

Common on practically every bush noticed in Essex Co. Reported also from Minnedosa, Man.

PEONY

BUD ROT and LEAF SPOT, caused by *Botrytis* sp.

Causing some loss in Carleton Co., Ontario, from failure of buds to open, secondary leaf infections, and general unthriftiness of the plant due to stem lesions at the ground level and below.

Specimens were sent from Prince Albert, Sask., and Belmont, Man.

LEAF and STEM SPOT, caused by *Septoria Paeoniae* West. var. *berolinensis* Allesch.

At Macdonald College, Que., the infections were estimated at 50% for all varieties.

ROOT ROT, caused by *Fusarium* spp.

Causing severe root rot of newly planted peonies

at Macdonald College, Que., This was not as prevalent as in 1922.

ROSE

POWDERY MILDEW, caused by *Sphaerotheca pannosa* (Wallr.) Lev.

Caused considerable damage to both rambler and bush roses at the Experimental Stations at Summerland and Agassiz, B.C.

RUST, caused by *Phragmidium* sp.

Man.- Common, but not serious.

Ont.- Abundant in the Niagara and Ottawa districts.

P.E.I.- Severe on wild roses; moderate on cultivated bushes.

BLACK SPOT, caused by *Actinonema Rosae* (Lib.) Fr.

Plentiful in the Niagara district of Ontario.

LEAF SPOT, caused by *Cercospora Rosaeicola* Pass.

Destructive on native roses in both south-eastern and south-western Manitoba. Collections were made at Napinka, Killarney and Brandon. The pathogen was kindly identified by Dr. J.J. Davis of Wisconsin.

CROWN GALL, caused by *Bacterium tumefaciens*, E.F.S.

A specimen of this disease on a climber was sent from Meaford, Ont.

SPIRAEA alba

LEAF SPOT, caused by
Septoria salicifolia (Trel.) Berl. et Vogl.

Reported from Neepawa, Man,

SNOWBERRY (Symphoricarpos sp.)

MILDEW, caused by
Microsphaera diffusa Cke. et Pk.

Reported from Winnipeg, Man.

LEAF SPOT, caused by
Septoria Symphoricarpi Hark.

Found at Neepawa and Winnipeg, Man.

SWEET PEA

ROOT ROT, caused by Fusarium sp.

This has been troublesome in some greenhouses in Ontario, especially in those that neglect to use lime in making their compost and grow sweet peas in succession on the same soil. (R.E. Stone)

POWDERY MILDEW, caused by
Microsphaera Alni (Wall.) Salm.

Common late in the season in south-eastern Manitoba.

MOSAIC, cause unknown

Small amount seen in one patch in Prince Edward Island.

DISEASES OF MISCELLANEOUS PLANTS

Agastache Foeniculum (Pursh) Ktze.	Giant hyssop
Sphaerotheca Humuli (DC.) Burr.	Mildew
Fisher Branch, Man.	
Amaranthus retroflexus L.	Pigweed
Albugo Bliti (Biv.) Kze.	White rust
Winnipeg, Man.	
Ambrosia trifida L.	Great ragweed
Puccinia Xanthii (Schw.)	Rust
Morris, Man.	
Arctium minus Bernh.	Common burdock
Puccinia Bardanae Cda.	Rust
Winnipeg, Man.	
Aster cordifolius L.	Purple aster
Erysiphe Asterum	Mildew
Inwood, Man.	
Coleosporium Solidaginis (Schw.) Thüm.	Rust
Inwood, Man., and Renfrew, Ont.	
Capsella bursa-pastoris (L.) Medic.	Shepherd's purse
Peronospora parasitica (Pers.) deB.	Downy mildew
Olds, Alta.	
Cirsium arvense (L.) Scop.	Canada thistle
Puccinia obtegens (L.) Tul.	Rust
Lanark and Carleton, Ont.	
Pyrenochaeta erysiphoides Sacc.	
Winnipeg, Man.	
Convolvulus sepium L.	Hedge bindweed
Puccinia Convolvuli (Pers.) Cast.	Rust
Neepawa, Man.	
Corylus americana Walt.	Hazelnut
Septoria corylina Peck.	Leaf spot
Carman, Man.	
Gnomoniella Coryli (Batsch.) Sacc.	
Stonewall, Man.	
Dracocephalum parviflorum Nutt.	Dragon head
Phyllosticta sp.	Leaf spot
Fisher Branch, Man.	
Hedysarum boreale Nutt.	
Uromyces Hedysari (DC.) Fckl.	Rust
Binscarth, Man.	

Helianthus Maximiliani Schrad.	Wild sunflower
Puccinia Helianthi Schw.	Rust
Winnipeg, Man.	
Juncus balticus Willd.	Baltic rush
Uromyces Junci (Desm.) Tul.	Rust
Kelliher, Man.	
Lathyrus ochraleucus Hooker	Everlasting pea
Uromyces Fabae (Pers.) deB.	Rust
Phyllosticta and Septoria spp.	Leaf spots
Fisher Branch, Man.	
Plantago major L.	Common plantain
Erysiphe lamprocarpa (Wallr.) Lev.	Mildew
Grandview and Winnipeg, Man.	
Polygonum aviculare L.	Knotweed
Erysiphe Polygoni DC.	Mildew
Winnipeg, Man.; Ottawa, Ont.	
Polygonum Convolvulus L.	Wild buckwheat
Puccinia Convolvuli Pers.	Rust
Winnipeg, Man.	
Smilax herbacea L.	Carrion flower
Phyllosticta sp.	Leaf spot
Neepawa, Man.	
Solidago sp.	Golden rod
Coleosporium Solidaginis (Schw.) Thüm.	Rust
Neepawa and Winnipeg, Man.	
Ribes cynosbati L.	Prickly gooseberry
Puccinia Pringsheimiana Kleb.	Rust
Sphaerotheca Mors-uvae (Schw.) B. et C.	Mildew
Parry Sound and Lanark, Ont.	
Sonchus arvensis L.	Perennial sow thistle
Septoria sonchifolia Cke.	Leaf spot
Fisher Branch and Winnipeg, Man.	
Taraxacum officinale Weber	Dandelion
Puccinia Taraxaci (Rabent.) Plowr.	Rust
Grandview, Man., and Ottawa, Ont.	
Sphaerotheca Humuli (DC.) Burr.	Mildew
Winnipeg, Man.	
Rammularia Taraxaci Karst.	Leaf spot
Winnipeg, Man.	

Vicia cracca L. Tufted vetch
Uromyces Fabae (Pers.) deB. Rust
Rainy River District, Ont.

The collaborators largely responsible for the reports on the diseases of miscellaneous plants are as follows:-

D.L. Bailey, H. Groh, W.T. MacClement and R.C. Russell.

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